PEB-2771/2781VG2A

Embedded System Board

User's Manual

Version 1.6

Copyright © Portwell, Inc., 2012 All rights reserved.
All other brand names are registered trademarks of their respective owners.

Table of Contents

How to Use This Manual

Chapter 1 System Overview 1-1

1.1 Introduction 1-1
1.2 Check List 1-1
1.3 Product Specification 1-2
1.4 System Configuration 1-3
1.5 System Architecture 1-7

Chapter 2 Hardware Configuration 2-1

2.1 Jumper Setting 2-1
2.2 Connector Allocation 2-2

Chapter 3 System Installation 3-1

3.1 Intel® N455/D525 3-1
3.2 Main Memory 3-1
3.3 Installing the Single Board Computer 3-1
3.3.1 Chipset Component Driver 3-2
3.3.2 Intel Integrated Graphics GMCH Chip 3-2
3.3.3 Intel Gigabit Ethernet Controller 3-2
3.3.4 Audio Controller 3-2
3.4 Clear CMOS Operation 3-2
3.5 WDT Function 3-3
3.6 GPIO 3-4

Chapter 4 BIOS Setup Information 4-1

4.1 Entering Setup -- Launch System Setup 4-1
4.2 Main 4-2
4.3 Advanced 4-3
4.4 PCIPnP 4-21
4.5 Boot 4-23
4.6 Security 4-28
4.7 Chipset 4-29
4.8 Exit 4-34

Chapter 5 Troubleshooting 5-1

5.1 Hardware Quick Installation 5-1
5.2 BIOS Setting 5-1

Appendix A

Appendix B

How to Use This Manual

The manual describes how to configure your PEB-2771VG2A/PEB-2781VG2A system to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1 : System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2 : Hardware Configuration. Shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3 : System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4 : BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5 : Troubleshooting. Provides various useful tips to quickly get PEB-2771VG2A/PEB-2781VG2A running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Portwell** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site : http://www.portwell.com.tw/.

Chapter 1
System Overview

1.1 Introduction

Portwell Inc., a world-leading innovator in the Industrial PC (IPC) market and a member of the Intel® Embedded and Communications Alliance (Intel ECA), announced today the Portwell PEB-2771/2781VG2A utilizing the Intel® ECX form factor based on the Intel® Atom™ processor D525/N455 and the Intel® System Controller Hub ICH8M, includes integrated, enhanced graphics and memory controllers on 45nm process technology, delivering significant power reduction, performance improvements and smaller platform footprint over the previous Intel® Atom™ processor N270. The PEB-2771/2781VG2A can provide the low power consumption for low profile fanless applications such as POS, Print Imaging, ATM, Kiosk, Medical, Panel PC, Digital Security and Digital Signage.

PEB-2771/2781VG2A supports dual display by VGA and 18/24-bit LVDS. With its display-enriched interface, PEB-2771/2781VG2A can support various multimedia devices and enriched IO interfaces that can supply various USB and COM devices.

PEB-2771/2781VG2A supports SO-DIMM memory slot for DDR3 SDRAM up to 2GB, and comes with PS/2 Keyboard and Mouse header, 4 x COM ports, 2 x SATA, 2 x Gigabit Ethernet, 6 x USB2.0 ports. It also support CompactFlash Socket and one Mini-PCIE socket for embedded application usage.

1.2 Check List

The PEB-2771/2781VG2A package should cover the following basic items

One PEB-2771/2781VG2A 3.5’ Main Board
One Thermal Kit
One Serial ATA cable
One SATA Power cable
One Installation Resources CD-Title

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Main processor**
  - Support Intel Atom processor D525/N455
  - CPU bus clock: 800 MHz
- **Chipset**
  -Intel® ICH8M
- **Main Memory**
  - Support signal channel DDR3 memory interface
  - Up to 2GB DDR3 800 SDRAM on SO-DIMM socket
- **System BIOS**
  -AMI BIOS
- **Expansion Interface**
  -One Mini-PCI Express socket
- **SATA Interface**
  -Two SATA ports
- **Serial Ports**
  -Support there RS-232 and one RS-232/422/485 serial ports
- **USB Interface**
  -Support six USB (Universal Serial Bus) ports (two at rear, four on-board for internal devices)
- **PS/2 Mouse and Keyboard Interface**
  -Support on board pin header for PS/2 keyboard/mouse
- **Audio Interface**
  -Support on board pin header for Mic-in/Line-out
- **Real Time Clock/Calendar (RTC)**
  -Support Y2K Real Time Clock/Calendar
- **Watchdog Timer**
  - Support WDT function through software programming for enable/disable and interval setting
  - Generate system reset
- **On-board VGA**
  - Intel Atom D525/N455 Integrated DX9 Graphics device
  - Support Intel DVMT 4.0
- **On-board Ethernet LAN**
  -Two Gigabit Ethernet (10/100/ 1000 Mbits/sec) LAN ports
- **High Driving GPIO**
  -Onboard programmable 8-bit Digital I/O interface

- **Cooling Fans**
  -Support one 3-pin power connector for system fan
- **System Monitoring Feature**
  -Monitor system temperature and major power sources, etc
- **Outline Dimension (L X W):**
  -146mm (5.75") X 105mm (4.0")

1.4 System Configuration

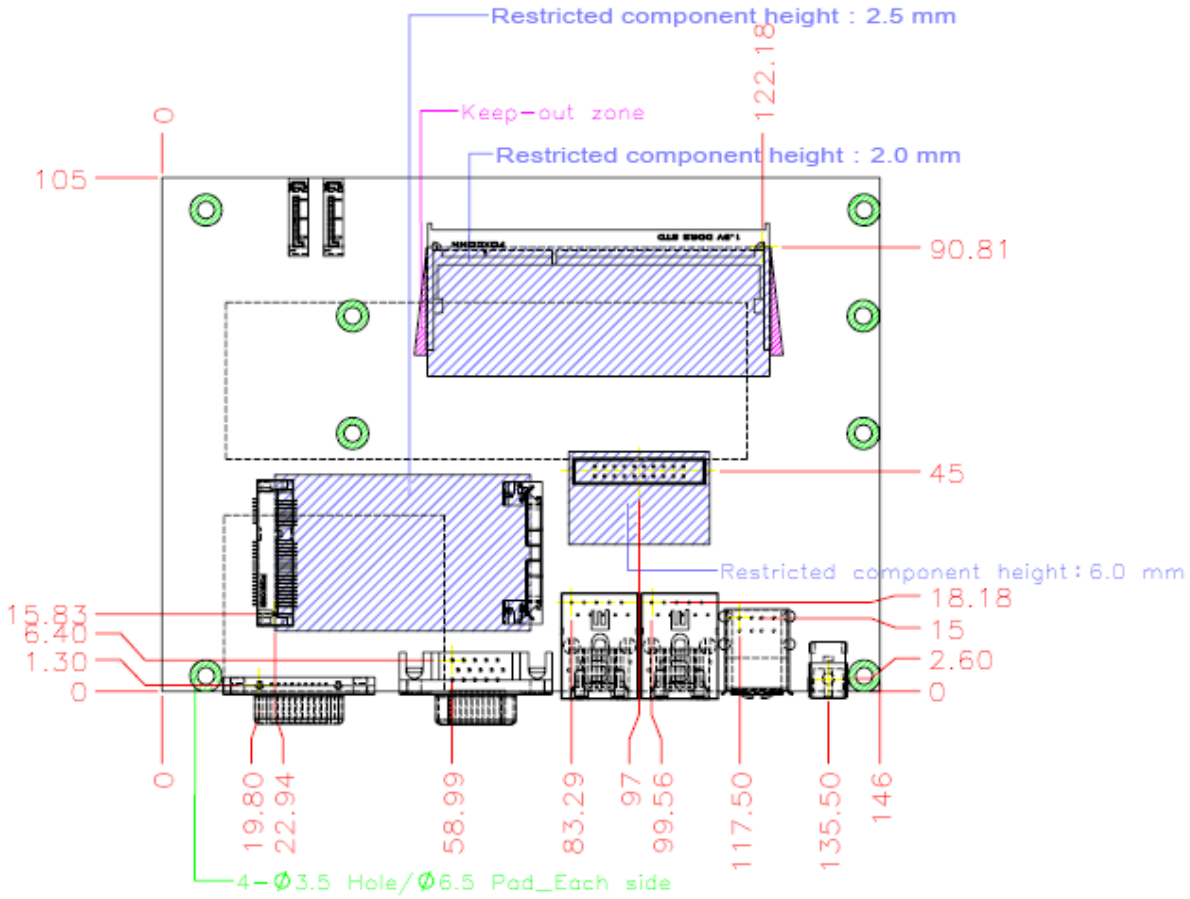
System Configuration	
CPU Type	Onboard Intel® Atom™ CPU D525 @1.8GHz L2:1MB FSB:800MHz
SBC BIOS	Portwell,Inc.PEB-2771 BIOS Rev.: R1.00.E0 (11112010)
Memory	Transcend DDR3 1066 2GB (Samsung K4B1G0846F)
VGA Card	Onboard Intel® Graphics Media Accellerator(Luna Pier) 3150
VGA Driver	Intel® Graphics Media Accellerator 3150 Version 6.14.10.5134
LAN Card	Onboard Intel® 82567V-3 Gigabit Network Connection
LAN Driver	Intel® 82567V-3 Gigabit Network Connection Version 10.1.6.0
LAN Card	Onboard Intel® 82583V Gigabit Network Connection
LAN Driver	Intel® 82583V Gigabit Network Connection Version 11.4.7.0
Audio Card	Onboard Realtek ALC888 Audio
Audio Driver	Realtek High Definition Audio Version 5.10.0.5296
Chip Driver	Intel® Chipset Device Software Version 9.1.1.1019
USB 2.0 Driver	Intel® ICH8 Family USB2 Enhanced Host Controller Version 9.1.1.1016
SATA HDD	Seagate ST3160815AS 160GB
Compact Flash	Apacer 128MB
CDROM	Lite-On LH-20A1S DVD-ROM
Power Supply	APH-3020

Programs for loading both CPU & VGA: Run Burning Test V5.3 RUN time: 10 / 30 Minutes.

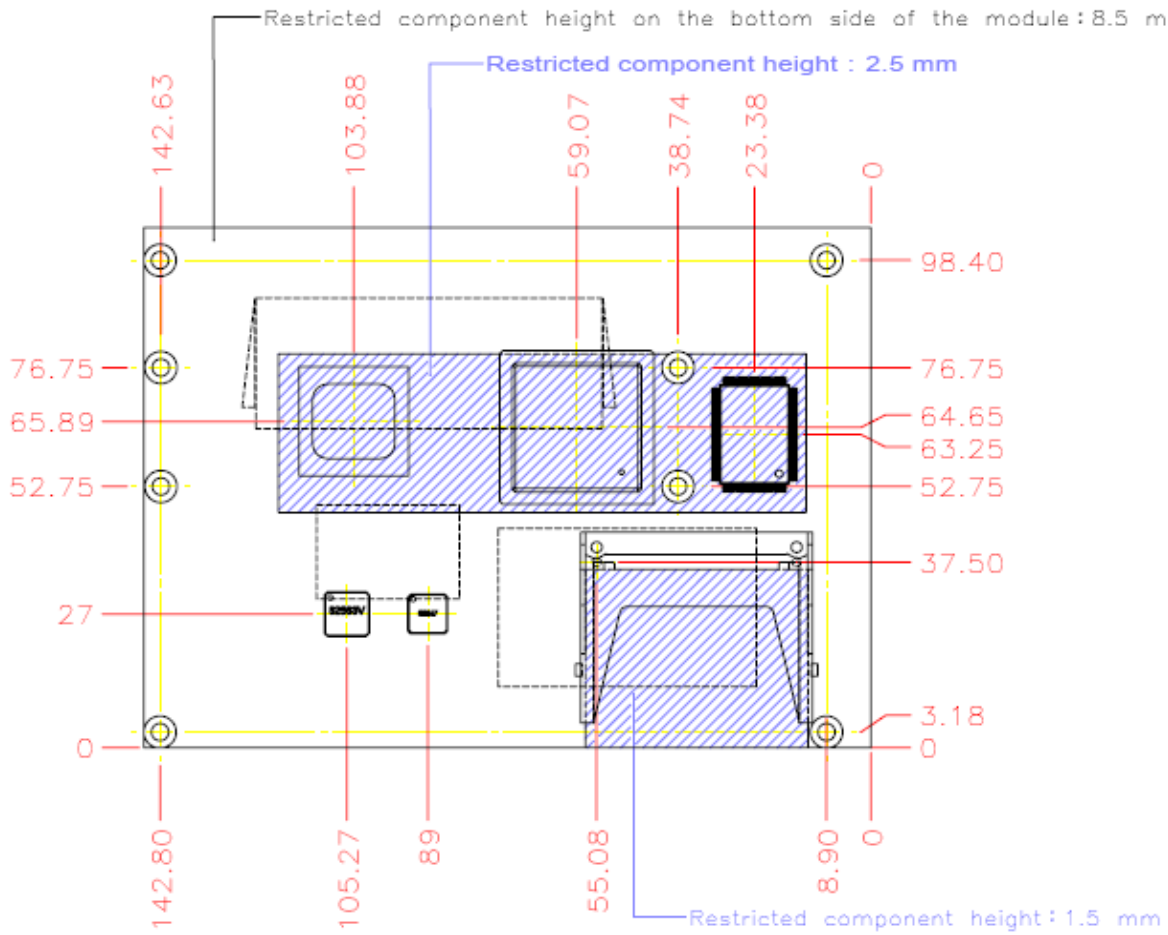
Item	Power ON	Full Loading 10Min	Full Loading 30Min
DC +12V	1.59	2.27	2.22
USB Loading Test	4.90 V/ 480 mA		

- **Operating Temperature:**
  0°C ~ 60°C
- **Storage Temperature:**
  -20°C ~ 80°C
- **Relative Humidity:**
  5% ~ 90%, non-condensing

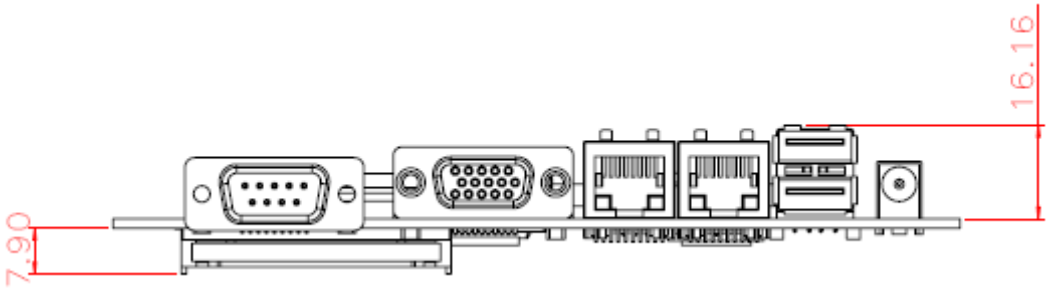
Mechanical Drawing



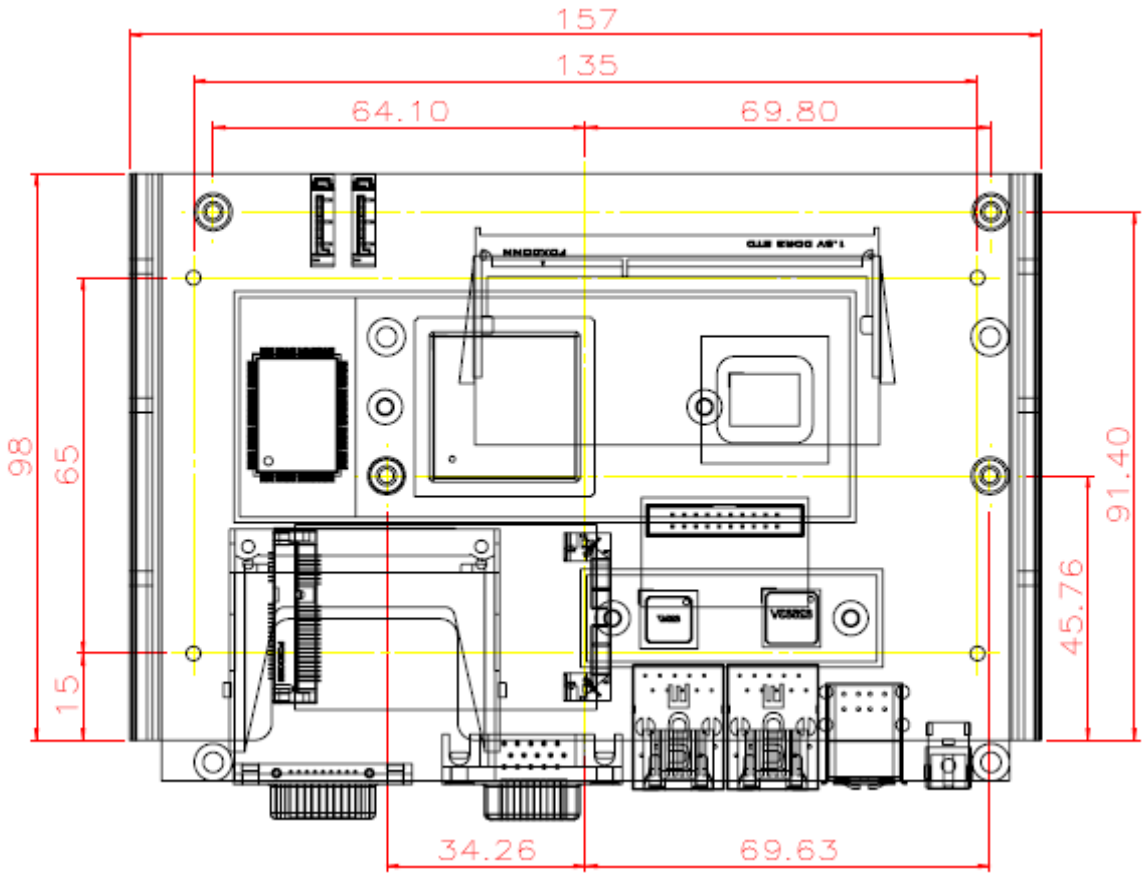
[TOP side]



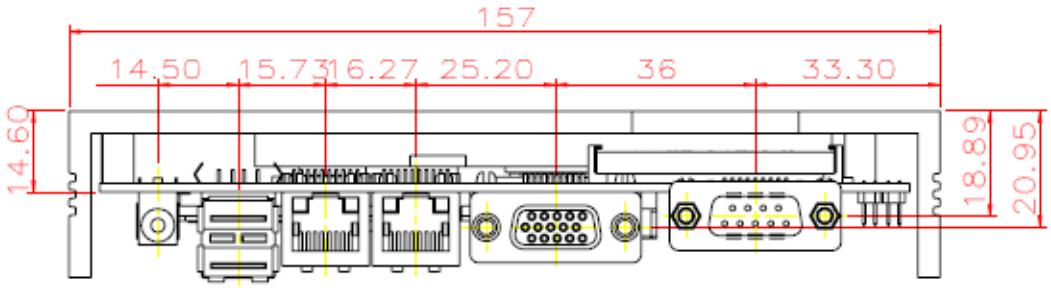
[Bottom side]



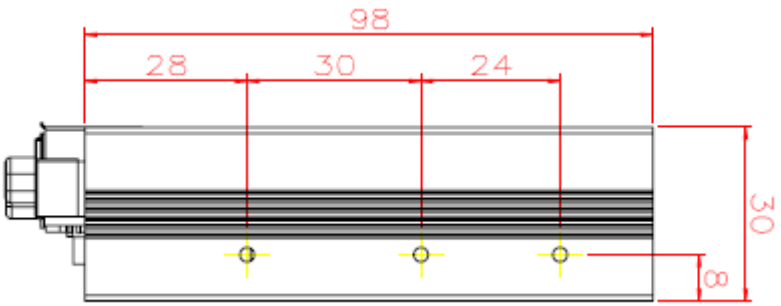
[Rear IO]



[Top side with thermal kit]

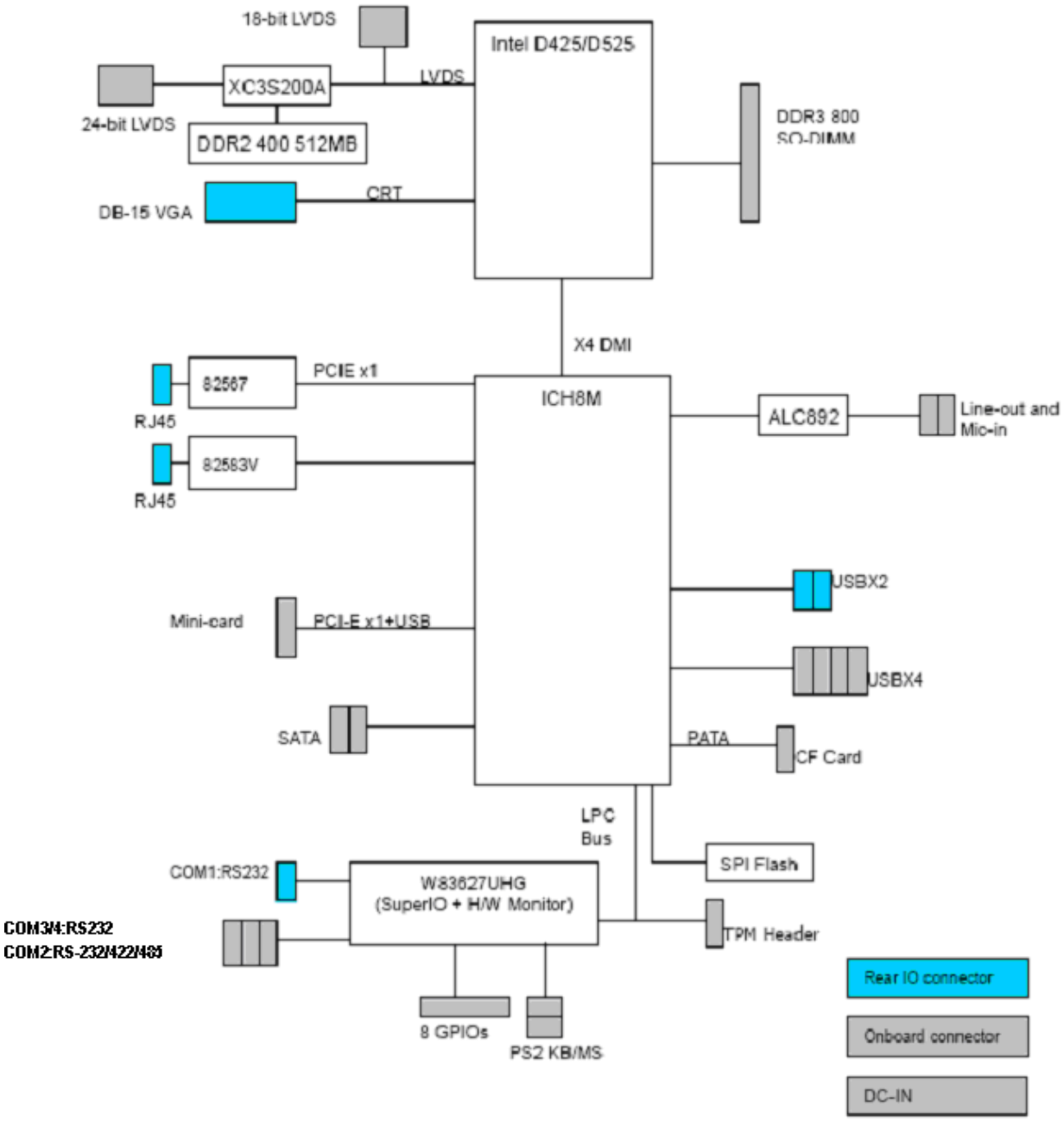


[Rear IO with thermal kit]



1.5 System Architecture

All of details operating relations are shown in PEB-2771/2781VG2A series System Block Diagram.



PEB-2771/2781VG2A System Block Diagram

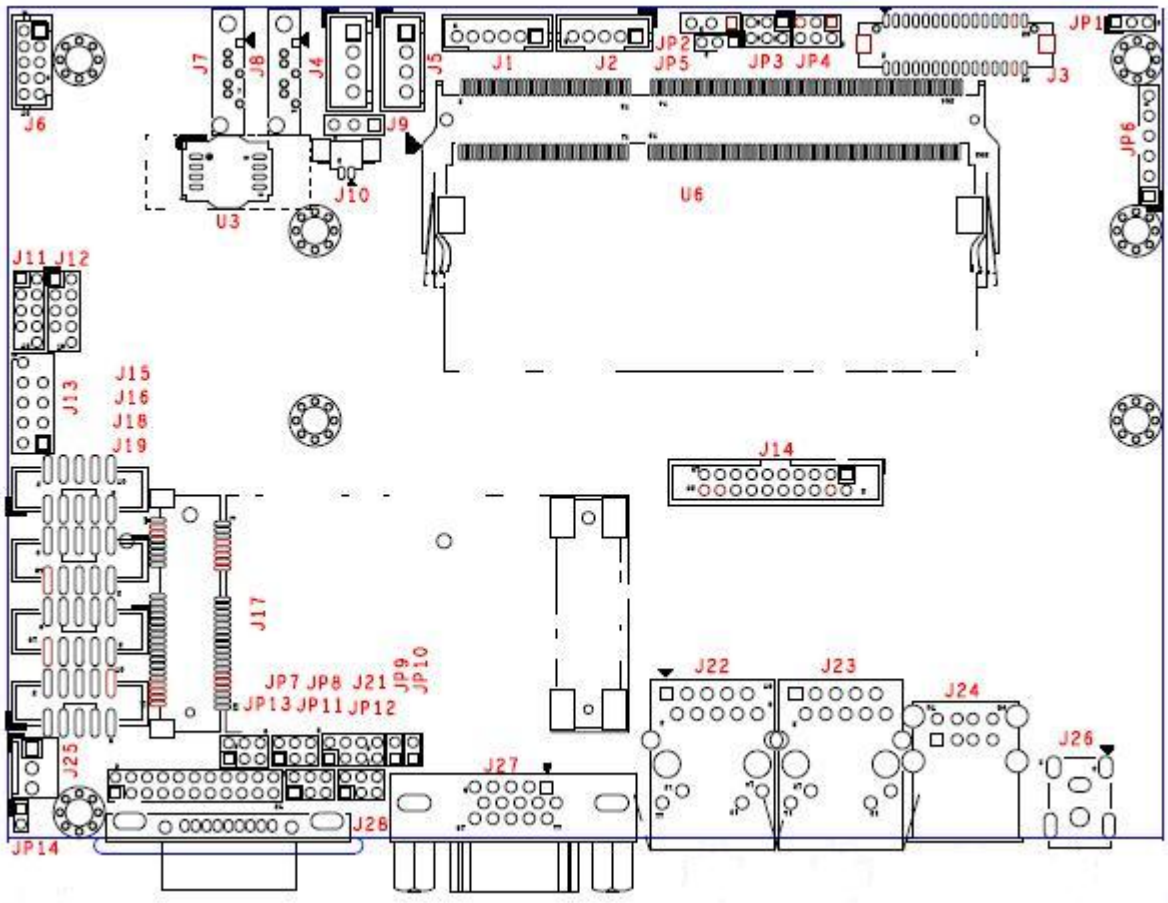
Chapter 2
Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connector. All of the configuration jumpers on PEB-2771/2781 are in the proper position. The default settings are indicated with a star sign (★).

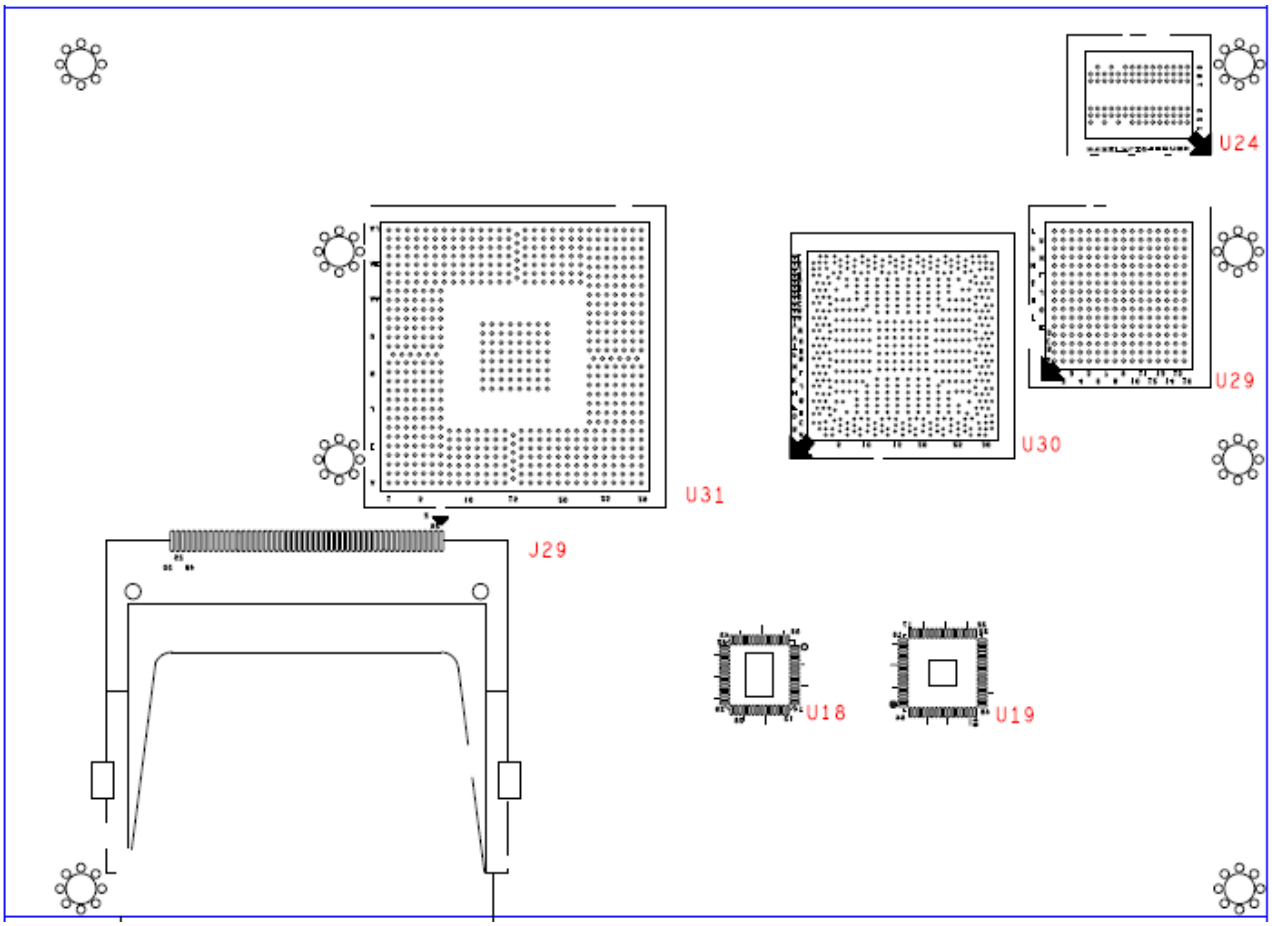
2.1 Jumper Setting

In general, jumpers on the single board computer are used to select options for certain features. Some of the jumpers are designed to be user-configurable, allowing for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (SHORT) or remove (NC) it from the jumper pins according to the following instructions. Here NC stands for "Not Connect"

Component side



Solder side



2.2 Connector Allocation

J1	PS/2 Keyboard/Mouse Connector (1*6 Pin Wafer/2.0mm)
J2	Inverter Power Connector (5*1 Pin Wafer)
J3	LCD LVDS Connector (15*2 Pin Hirose)
J4	SATA Power 2 Output Connector (1*4 Pin Wafer/2.5mm)
J5	SATA Power 1 Output Connector (1*4 Pin Wafer/2.5mm)
J6	Line-OUT/Line-IN/Microphone connector (5*2-1 Pin Header)
J7	SATA2 Connector
J8	SATA1 Connector
J9	SATA Power 2 voltage Setup (1*3 Pin Header/2.54mm)
J11	USB (3~2) Connector (5*2-1 Pin Header/2.0mm)
J12	USB (4~5) Connector (5*2-1 Pin Header/2.0mm)
J13	Port 80 Connector (2x5-1(Pin 9) Pin Header/2.54mm)
J14	TPM Connector
J15	GPIO Connector (5*2 Pin BOX Header/2.0mm)
J16	COM4 (RS-232) (2*5 Pin BOX Header/2.0mm)
J17	MINI-PCI-E Connector.

J18	COM3 (RS-232) (2*5 Pin BOX Header/2.0mm)
J19	COM2 (RS-232) (2*5 Pin BOX Header/2.0mm)
J21	System Panel Connectors (2*4 Pin Header/2.0mm)
J22	LAN 1 Connector (RJ-45)
J23	LAN 2 Connector (RJ-45)
J24	USB (0~1) Connector (USB A Typex2)
J25	CPU Fan Connector (3*1 Pin Wafer)
J26	Power Input Connector (Din Jack 3 Pin)
J27	VGA Connector (D-SUB15 Pin Female)
J28	COM1 (RS-232) (D-SUB9 Pin Male)
J29	Compact Flash Card Connector (Type I & II)
U6	DDR3 SDRAM Connector (SO-DIMM 204 Pin)
JP1	18 to 24 bits bypass and scaler voltage select (3x1 Pin Header/2.0mm)
JP2	CMOS Setup (1*3 Pin Header/2.0mm)
JP3	LVDS for 18 to 24 Bits mode adjust
JP4	LCD Panel Voltage Setup (2*3 Pin Header/2.0mm)
JP5	LCD Panel Light Enable Voltage Setup (1*3 Pin Header/2.0mm)
JP6	18 to 24 bits Chip programming(6x1 Pin Header/2.54mm)
JP7	COM4 RI Function Setup (3x2 Pin Header/2.0mm)
JP8	COM3 RI Function Setup (3x2 Pin Header/2.0mm)
JP9	Suspend LED Connector (1x2 Pin Header/2.0mm)
JP10	Case Open Detect Connector (1x2 Pin Header/2.0mm)
JP11	COM1 RI Function Setup (3x2 Pin Header/2.0mm)
JP12	COM2 RI Function Setup (3x2 Pin Header/2.0mm)
JP13	COM2 RS232/RS422/RS485 Function Setup(13x2 Pin Header/2.0mm)
JP14	CF MASTER/SLAVE Setup (1x2 Pin Header/2.0mm)

Pin Assignments of Connectors

J1: PS/2 Keyboard/Mouse Connector (1*6 Pin Wafer/2.0mm)

PIN NO.	DESCRIPTION
1	K/B CLK
2	M/S DATA
3	K/B DATA
4	KB5V
5	M/S CLK
6	GND

J2: Inverter Power Connector (5*1 Pin Wafer)

PIN NO.	DESCRIPTION
1	+5V
2	GND
3	+12V
4	LCD_BL ADJ
5	LCD_BL EN

J3: LCD LVDS Connector (15*2 Pin Hirose)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
2	VDD	1	VDD
4	LCD1DO0-	3	LCD1DO0+
6	LCD1DO1-	5	LCD1DO1+
8	LCD1DO2-	7	LCD1DO2+
10	LCD1DO3-	9	LCD1DO3+
12	LCD1CLK-	11	LCD1CLK+
14	LDATA1	13	LCLK1
16	Ground	15	Ground
18	LCD2DO0-	17	LCD2DO0+
20	LCD2DO1-	19	LCD2DO1+
22	LCD2DO2-	21	LCD2DO2+
24	LCD2DO3-	23	LCD2DO3+
26	LCD2CLK-	25	LCD2CLK+
28	N/C	27	N/C
30	Ground	29	Ground

J4: SATA Power 2 Output connector (1*4 Pin Header/2.54mm)

PIN NO.	DESCRIPTION
1	12V
2	GND
3	GND
4	+5V

J5: SATA Power 12 Output connector (1*4 Pin Header/2.54mm)

PIN NO.	DESCRIPTION
1	12V
2	GND
3	GND
4	+5V

J6: Line-OUT/Line-IN/Microphone connector (5*2 Pin Wafer/2.0mm)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MIC in L	2	GND
3	Line in L	4	GND
5	Line in R	6	GND
7	Line out L	8	GND
9	Line out R	10	MIC in R

J7.J8: SATA1 Connector

PIN NO.	Signal Description
S1	GND
S2	TX+
S3	TX-
S4	GND
S5	RX-
S6	RX+
S7	GND

J10: Battery Connector (1*2 Pin Wafer/2.0mm)

PIN NO.	DESCRIPTION
1	Battery+
2	Battery-

J11: USB (3~2) Connector (5*2-1 Pin Header/2.0mm)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	+5V
3	USB_D4-	4	USB_D5-
5	USB_D4+	6	USB_D4+
7	GND	8	GND
		10	GND

J12: USB (5~4) Connector (5*2-1 Pin Header/2.0mm)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	+5V
3	USB_D3-	4	USB_D2-
5	USB_D3+	6	USB_D2+
7	GND	8	GND
		10	GND

J13: Port 80 Connector (2x5-1(Pin 9) Pin Header/2.54mm)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LPC AD0	2	+3.3V
3	LPC AD1	4	RESET
5	LPC AD2	6	LPC FRAME
7	LPC AD3	8	LPC PCICLK
		10	NC

J14: TPM (10*2 Pin Header/2.0mm)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCLK_TPM	2	GND
3	LFRAME#	4	NC
5	PLT_RST#	6	VCC
7	LAD3	8	LAD2
9	VCC3	10	LAD1
11	LAD0	12	GND
13	SMB_CLK	14	SMB_DATA
15	3V_DUAL	16	SERIRQ
17	GND	18	NC
19	LPCPD#	20	NC

J15: GPIO Connector (5*2 Pin BOX Header/2.0mm)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GPIO0 reverse output	2	GPIO0
3	GPIO1 reverse output	4	GPIO1
5	GPIO2 reverse output	6	GPIO2
7	GPIO3 reverse output	8	GPIO3
9	+5V	10	GND

J16: COM4 (RS-232) (2*5 Pin BOX Header/2.0mm)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD#4	2	DSR#4
3	RXD#4	4	RTS#4
5	TXD#4	6	CTS#4
7	DTR#4	8	V_RI4
9	GND	10	NC

J17: Mini-PCI-E Connector

J18: COM3 (RS-232) (2*5 Pin BOX Header/2.0mm)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD#4	2	DSR#4
3	RXD#4	4	RTS#4
5	TXD#4	6	CTS#4
7	DTR#4	8	V_RI4
9	GND	10	NC

J19: COM2 (RS-232) (2*5 Pin BOX Header/2.0mm)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD#4	2	DSR#4
3	RXD#4	4	RTS#4
5	TXD#4	6	CTS#4
7	DTR#4	8	V_RI4
9	GND	10	NC

J21: System Panel Connectors (2*4 Pin Header/2.0mm)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDD LED +	2	HDD LED-
3	PWRLED+	4	PWRLED-
5	GND	6	SYS_RESET#
7	PWR_ON_SW#	8	GND

J22: LAN 2 Connector (RJ-45)

J23: LAN 1 Connector (RJ-45)

J24: USB (0~1) Connector (USB A Typex2)

J25: CPU Fan Connector (3*1 Pin Wafer)

PIN NO.	Signal Description
1	Fan Speed Detect
2	+12V
3	Fan Speed Driver

J26: Power Input Connector (Din Jack 3 Pin)

PIN NO.	Signal Description
1	VIN
2	GND
3	GND
CG1	GND

J27: VGA Connector (D-SUB15 Pin Female)

J28: COM1 (RS-232) (D-SUB9 Pin Male)

J29: Compact Flash Card Connector (Type I & II)

U6: DDR3 SDRAM Connector (SO-DIMM 204 Pin)

JP1: 18 to 24 bits bypass and scaler mode voltage Setup (1*3 Pin Header/2.0mm)

PIN NO.		DESCRIPTION
1-2	**2-3**	
Short		+1.8V (Scaler)★
	Short	+2.5V(Bypass)

JP2: CMOS Setup (1*3 Pin Header/2.0mm)

PIN NO.	Signal Description
1-2	Normal (Keep CMOS Setup) ★
3-4	Clear CMOS Setup

JP3: LVDS for 18 to 24 Bits mode adjust

PIN NO.			DESCRIPTION
1-2	**3-4**	**5-6**	
			24 bit 2CH Panel
	Short		24 bit 1CH Panel(Open LDI Mode)
Short	**Short**		24 bit 1CH Panel(SPWG Mode)
		Short	18 bit 1CH Panel

JP4: LCD Panel Voltage Setup (2*3 Pin Header/2.0mm)

PIN NO.			DESCRIPTION
2-4	**4-6**	**3-4**	
Short			+3.3V TFT LCD ★
	Short		+5V TFT LCD
		Short	+12V TFT LCD

JP5: LCD Panel Light Enable Voltage Setup (1*3 Pin Header/2.0mm)

PIN NO.		DESCRIPTION
1-2	**2-3**	
Short		+3.3V ★
	Short	+5V

JP7: COM4 RI Function Setup (3x2 Pin Header/2.0mm)

PIN NO.			DESCRIPTION
1-2	**3-4**	**5-6**	
Short			+5V Output
	Short		RI Function ★
		Short	+12V Output

JP8: COM3 RI Function Setup (3x2 Pin Header/2.0mm)

PIN NO.			DESCRIPTION
1-2	**3-4**	**5-6**	
Short			+5V Output
	Short		RI Function ★
		Short	+12V Output

JP9: Suspend LED Connector (1x2 Pin Header/2.0mm)

PIN NO.	DESCRIPTION
1	Suspend LED+
2	GND

JP10: Case Open Detect Connector (1x2 Pin Header/2.0mm)

PIN NO.	DESCRIPTION
1	CASEOP#
2	GND

JP11: COM1 RI Function Setup (3x2 Pin Header/2.0mm)

PIN NO.			DESCRIPTION
1-2	3-4	5-6	
Short			+5V Output
	Short		RI Function ★
		Short	+12V Output

JP12: COM2 RI Function Setup (3x2 Pin Header/2.0mm)

PIN NO.			DESCRIPTION
1-2	3-4	5-6	
Short			+5V Output
	Short		RI Function ★
		Short	+12V Output

JP13: COM2 RS232/RS422/RS485 Function Setup)

PIN NO.							DESCRIPTION
5-6	9-11	10-12	15-17	16-18	Other		
Short	**Short**	**Short**	**Short**	**Short**	**Open**		RS-232 Function★
PIN NO.							**DESCRIPTION**
3-4	7-9	8-10	13-15	14-16	21-22	Other	
Short	**Short**	**Short**	**Short**	**Short**	**Short**	**Open**	RS-422 Function
PIN NO.							**DESCRIPTION**
1-2	7-9	8-10	19-20	Other			
Short	**Short**	**Short**	**Short**	**Open**			RS-485 Function

JP14: CF MASTER/SLAVE Setup (1x2 Pin Header/2.0mm)

PIN NO.	DESCRIPTION
1-2	MASTER ★
Short	Normal (SLAVE)
Open	MASTER ★

Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel® N455/D525

- Intel® Atom D525 Processor (1M Cache, 1.8GHz, Max TDP 13 Watts)
- Intel® Atom N455 Processor (512K Cache, 1.66GHz, Max TDP 6.5 Watts)

3.2 Main Memory

PEB-2781 provide 1 x 200pin SO-DIMM sockets which supports 800 DDR3-SDRAM as main memory, Non-ECC (Error Checking and Correcting), non-register functions. The maximum memory can be up to 2GB. Memory clock and related settings can be detected by BIOS via SPD interface.

For system compatibility and stability, do not use memory module without brand. Memory configuration can be set to either one double-sided DIMM in one DIMM socket or two single-sided SO-DIMM in both sockets.

Beware of the connection and lock integrity from memory module to socket. Inserting improperly it will affect the system reliability.
Before locking, make sure that all modules have been fully inserted into the card slots.

Note:

To insure the system stability, please do not change any of DRAM parameters in BIOS setup to modify system the performance without acquired technical information.

3.3 Installing the Single Board Computer

To install your PEB-2781 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position

Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place PEB-2781 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING
Please ensure that SBC is properly inserted and fixed by mechanism.

Note:
Please refer to section 3.3.1 to 3.3.7 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

PEB-2781 uses state-of-art Intel® N455 CPU. It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows XP, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in PEB-2781 CD-title.

3.3.2 Intel Integrated Graphics GMCH Chip

PEB-2781 uses Intel® N455 integrated graphic chipset to gain an outstanding graphic performance. PEB-2781 supports VGA, LVDS dual display. This combination makes PEB-2781 an excellent piece of multimedia hardware.

Drivers Support
Please find all the drivers in the PEB-2781 CD-title. Drivers support , Windows XP/Vista/Win7.

3.3.3 Intel Gigabit Ethernet Controller

Drivers Support
Please find INTEL 82567V&82583V LAN driver in /Ethernet directory of PEB-2781 CD-title. The drivers support Windows XP/Vista/Win7.

3.3.4 Audio Controller

Please find Intel® Realtek ALC888 (High Definition Audio driver) form PEB-2781 CD-title. The drivers support Windows XP/Vista/Win7.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumpers at proper position.

(JP2)RTC Reset

	Function	JP5
Default	Normal Operation	1-2 Short
	Clear CMOS	2-3 Short

3.5 WDT Function

The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware varies from boards to boards.

PEB-2771VG2A/PEB-2781VG2A allows users control WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset or to non-maskable interrupt (NMI), when time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process. A well-written WDT program should keep the counting process running under normal condition. WDT should never generate a system reset or NMI signal unless the system runs into troubles.

The related Control Registers of WDT are all included in the following sample program that is written in C language. User can fill a non-zero value into the Time-out Value Register to enable/refresh WDT. System will be reset after the Time-out Value to be counted down to zero. Or user can directly fill a zero value into Time-out Value Register to disable WDT immediately. To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed.

Additionally, there are maximum 2 seconds of counting tolerance that should be considered into user' application program. For more information about WDT, please refer to Winbond W83627UHG data sheet.

There are two PNP I/O port addresses that can be used to configure WDT,
1) 0x2E:EFIR (Extended Function Index Register, for identifying CR index number)
2) 0x2F:EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of WDT.

```
//Step1. Enter W83627UHG configuration registers mode:
outportb(0x2E, 0x87);
outportb(0x2E, 0x87);

//* Step2. Pin89 to be WDTO
outportb(0x2E, 0x2b);
outportb(0x2E + 1, 0x04);

//* Step3. Select logic device 8:
outportb(0x2E, 0x07);
outportb(0x2E + 1, 0x08);
```

```
   //* Step4. Config WDT using second to be unit:
   outportb(0x2E, 0xf5);
   outportb(0x2E + 1, 0x00);

   //* Step5. Set WDT time-out time:
   outportb(0x2E, 0xf6);
   outportb(0x2E + 1, time_out);

   //* Step6. Exit configuration registers mode:
   outportb(0x2E, 0xaa);
```

3.6 GPIO

```
/*          W83627UHG GPIO DEMO PROGRAM
                File Name : 2780GPIO.C
                Write by : Eason Huang
*/

#include <stdio.h>
#include <conio.h>
#include <dos.h>


#define Superio2_Addr    0x2E
/* #define DEBUG                    1 */



void enter_Superio2_CFG(void)
{
   outportb(Superio2_Addr, 0x87);
   outportb(Superio2_Addr, 0x87);
}



void exit_Superio2_CFG(void)
{
   outportb(Superio2_Addr, 0xAA);
}
```

```
void Set_CFG2(unsigned char Addr2,unsigned char Value2)
{
  unsigned char d2;
    outportb(Superio2_Addr, Addr2);
    delay(2);
    outportb(Superio2_Addr +1, Value2);
#ifdef DEBUG
    d2 = inportb(Superio2_Addr+1);
    printf("\nWrite %x to CR%x, read back is:%x",Value2,Addr2,d2);
#endif /*DEBUG*/
    delay(2);
}



unsigned char Get_CFG2(unsigned char Addr2)
{
  unsigned char d2;
    outportb(Superio2_Addr, Addr2);
    delay(2);
    d2 = inportb(Superio2_Addr+1);
#ifdef DEBUG
    printf("\nGet data %x from CR%x",d2,Addr2);
#endif /*DEBUG*/
    delay(2);
    return(d2);
}

int main(void)
{

    unsigned char d2;
    printf("\n--------------------------------------------------------------------------");
    printf("\n-              PEB-2771/2781 GPIO TEST Program R1.0              -");
    printf("\n--------------------------------------------------------------------------");
    printf("\n Please short the following pins with 2.00mm-pitched jumper on J13");
    printf("\n P.S: SIO: W83627UHG, Winbond");
    printf("\n GP50(J13 PIN 1)----GP57(J13 PIN 2)");
    printf("\n GP51(J13 PIN 3)----GP56(J13 PIN 4)");
    printf("\n GP52(J13 PIN 5)----GP55(J13 PIN 6)");
    printf("\n GP53(J13 PIN 7)----GP54(J13 PIN 8)");
    printf("\n GND (J13 PIN10)****VCC (J13 PIN 9)");
    printf("\n\n Starting...");
```

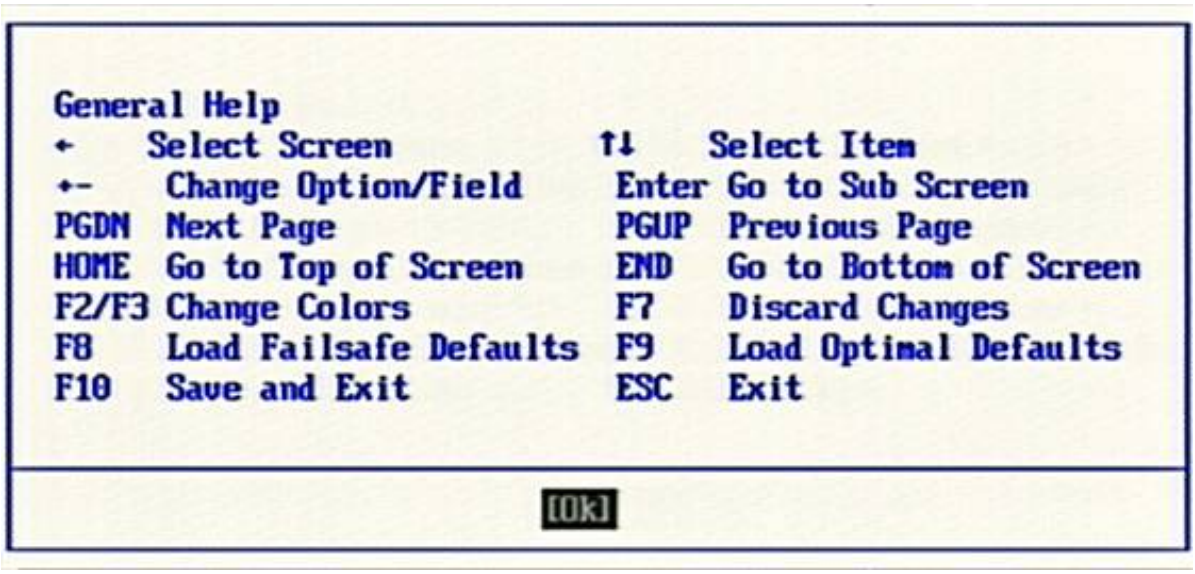
```
   enter_Superio2_CFG();                                    // 87 87
   /* CR2A B7 = 1 selet GPIO Port 1*/
   d2 = Get_CFG2(0x2A);
   d2 = (d2 & 0x7F) | 0x80;
   Set_CFG2(0x2A, d2);

   /* IO test loop 1 */
   /* Set GPIO Port 5 Enable */
   Set_CFG2(0x07, 0x08);    /* Select logic device 08*/
   Set_CFG2(0x30, 0x02);    /* Enable GPIO Port 5 */

//-------------------------------------------------------------------------------------------------
//    GPIO50->57
//    GPIO51->56
//    GPIO52->55
//    GPIO53->54
//-------------------------------------------------------------------------------------------------
   /* Set GPIO Port 5 of Superio2 Enable */

   Set_CFG2(0x07, 0x08);    /* Select logic device 08*/
   Set_CFG2(0xE0, 0xF0);      /* GPIO Port 5 is [11110000], 0: output, 1:input */
   Set_CFG2(0xE2, 0x00);      /* GPIO Port 5 is non-inversed*/

   delay(2);

   Set_CFG2(0x07, 0x08);    /* Select logic device 08*/
   Set_CFG2(0xE1, 0x0F);    /* GP50~53 of Superio2 -> GP57~54 of Superio2 */

   delay(100);
   Set_CFG2(0x07, 0x08);    /* Select logic device 08*/
   d2 = Get_CFG2(0xE1);    /* get GPIO Port 6 data */

   //printf("\n%x",d2);
   if ((d2&0xFF) == 0x0F ){
     printf("\n GPIO[50,51,52,53]->[57,56,55,54] test ok!");
   }
   else{
     printf("\n GPIO[50,51,52,53]->[57,56,55,54] test fail!");
   }

   return(0);
}
```

Chapter 4
BIOS Setup Information

PEB-2781 is equipped with the AMI BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, PEB-2781 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

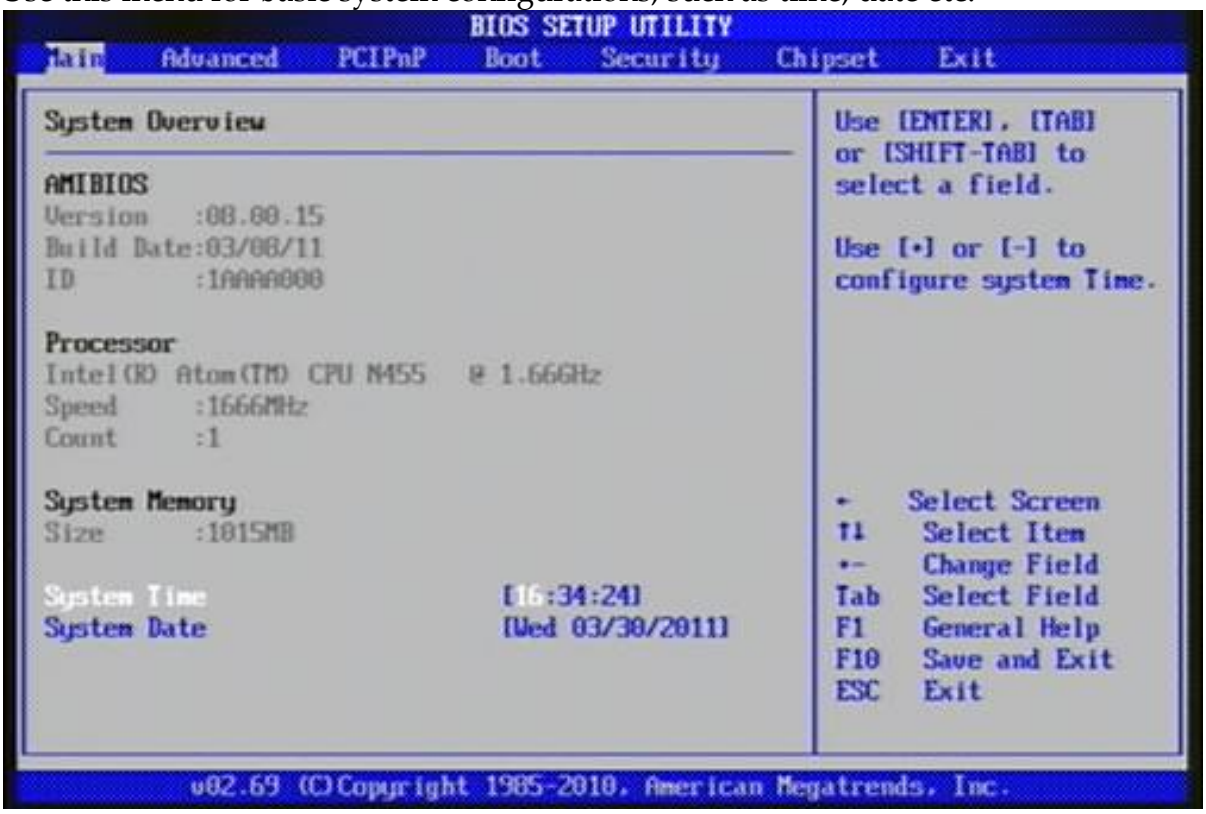
4.1 Entering Setup -- Launch System Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key to enter Setup.
Press <Del> to enter SETUP
If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.
Press <F1> to Run SETUP or Resume
The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.



4.2 Main

Use this menu for basic system configurations, such as time, date etc.



AMI BIOS, Processor, System Memory

These items show the firmware and hardware specifications of your system. Read only.

System Time

The time format is <Hour> <Minute> <Second>. Use [+] or [−] to configure system Time.

System Date

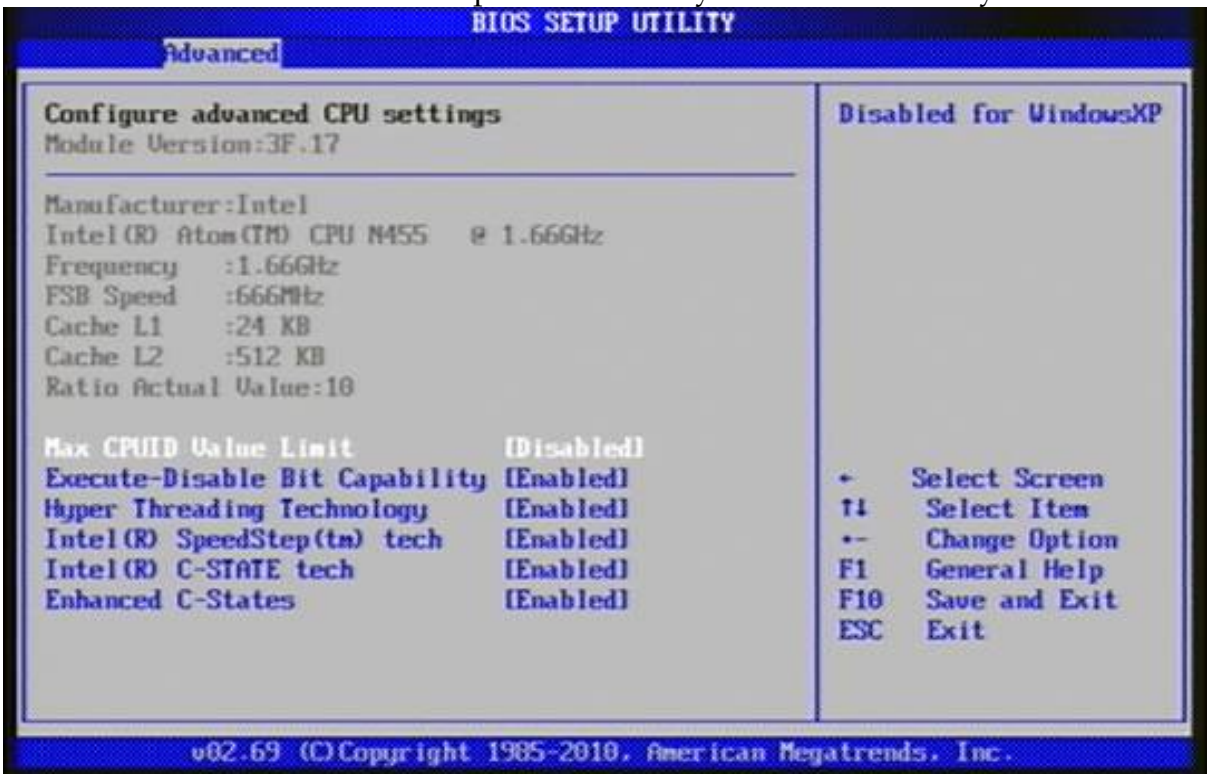
The date format is <Day>, <Month> <Date> <Year>. Use [+] or [−] to configure system Date.

4.3 Advanced

Use this menu to set up the items of special enhanced features.

CPU Configuration

These items show the advanced specifications of your CPU. Read only.



Max CPUID Value Limit

Disabled for Windows XP

The choice: Disabled, Enabled.

Execute-Disable Bit capability

When disabled, force the XD feature flag to always return 0

The choice: Disabled, Enabled.

Hyper Threading Technology

"Enabled" for Windows XP and Linux 2.4.X (OS optimized for Hyper-Threading Technology and "Disabled" for other OS (OS not optimized for Hyper-Threading Technology).

The choice: Enabled, Disabled.

Intel(R) Speed Step (tm) Tech

Disable: Disable GV3.

Enable: Enable GV3.

Intel(R) C-STATE Tech

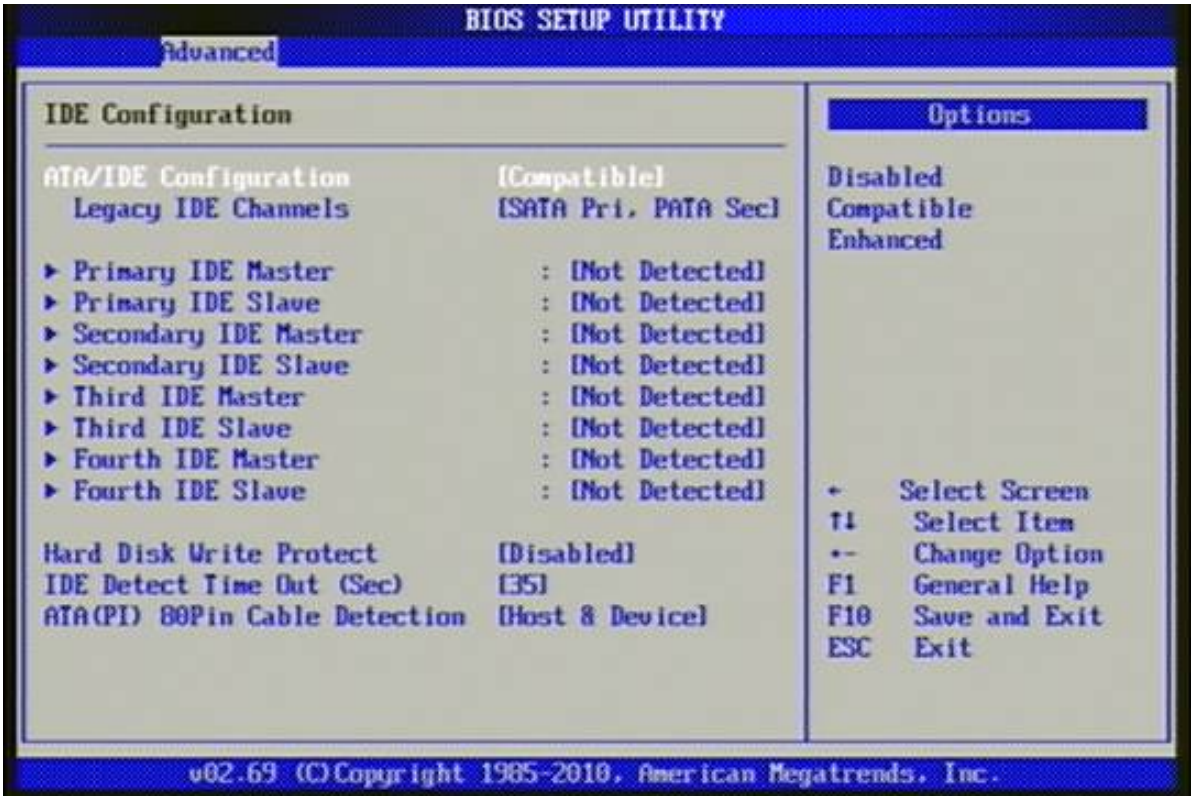
CPU idle is set to C2, C3, C4 State.

Enhanced C-States

CPU idle is set to Enhanced C-States.

IDE Configuration

The IDE Configuration the IDE devices, such as hard disk drive or CD-ROM drive. It uses a separate sub menu to configure each hard disk drive (Master and Slave).


BIOS SETUP UTILITY
Advanced
IDE Configuration
ATA/IDE Configuration [Compatible]
Legacy IDE Channels [SATA Pri, PATA Sec]
Primary IDE Master : [Not Detected]
Primary IDE Slave : [Not Detected]
Secondary IDE Master : [Not Detected]
Secondary IDE Slave : [Not Detected]
Third IDE Master : [Not Detected]
Third IDE Slave : [Not Detected]
Fourth IDE Master : [Not Detected]
Fourth IDE Slave : [Not Detected]
Hard Disk Write Protect [Disabled]
IDE Detect Time Out (Sec) [35]
ATA(PI) 80Pin Cable Detection [Host & Device]
Options
Disabled
Compatible
Enhanced
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.69 (C)Copyright 1985-2010, American Megatrends, Inc.

ATA/IDE Configuration

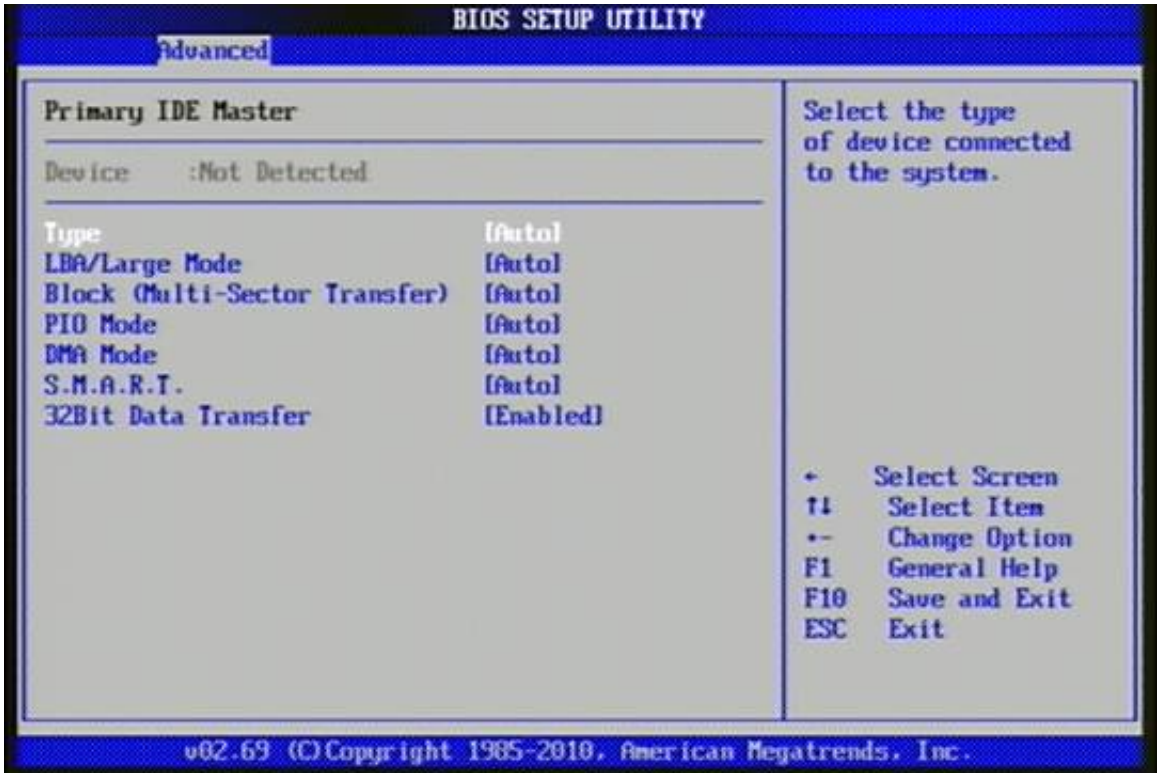
The choice: Disabled, Compatible, Enabled.

Legacy IDE Channels

The choice: SATA Only, SATA Pri,PATA Sec, PATA Only.

Primary / Secondary / Third / Fourth /Fifth IDE Master / Slave

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.



[Type] Press PgUp/<+> or PgDn/<－> to select [Not Installed], [Auto], [CD/DVD] or [ARMD] type. You can use [Manual] to define your own drive type manually.

[LBA/Large Mode] Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors.

[Block (Multi-Sector Transfer)] Any selection except Disabled determines the number of sectors transferred per block.

[PIO Mode] Indicates the type of PIO (Programmed Input/Output)

[DMA Mode] Indicates the type of Ultra DMA

[S.M.A.R.T.] This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S. M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

[32 Bit Data Transfer] Enable/Disable 32-bit Data Transfer.

Hard Disk Write Protect

Disabled/Enabled device write protection, this will be effective only if device is accessed through BIOS.

The choice: Disabled, Enabled.

IDE Detect Time Out (Sec)

Select the time out value for detecting ATA/ATAPI device (s).

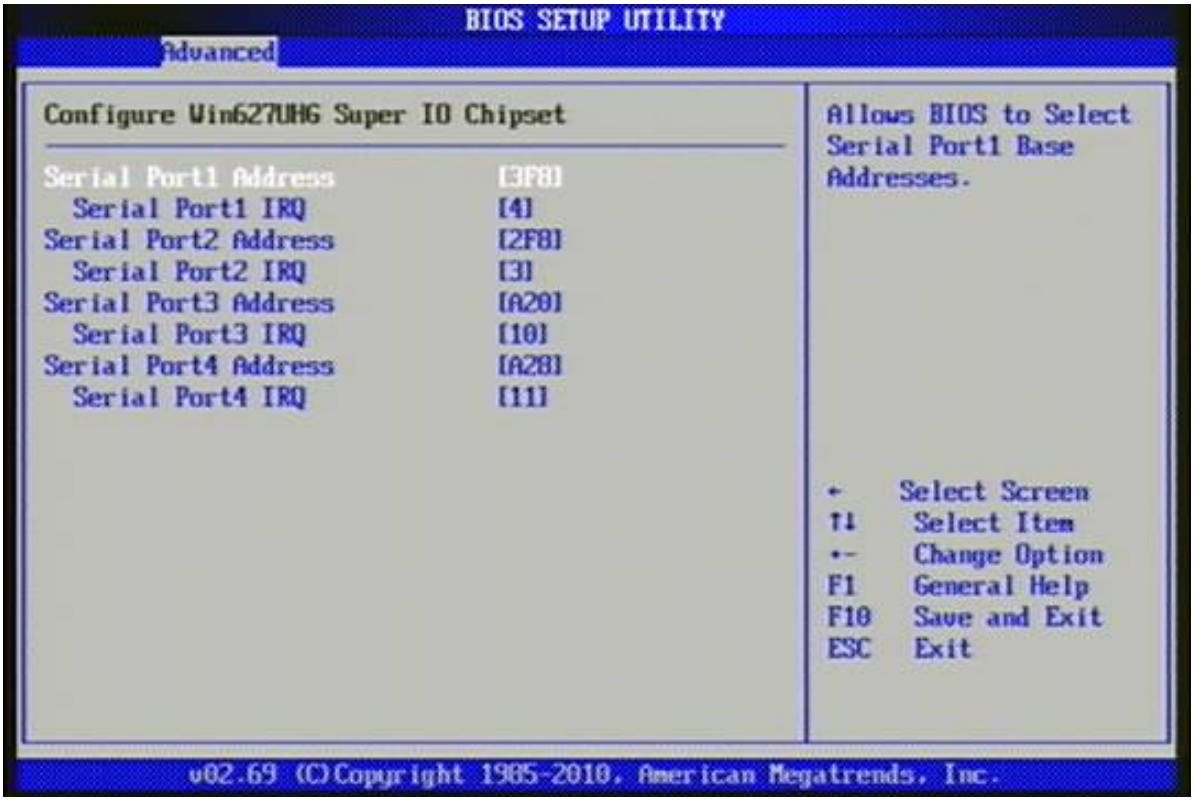
The choice: 0, 5, 10, 15, 20, 25, 30, 35.

ATA(PI) 80Pin Cable Detection

Select the mechanism for detecting 80Pin ATA (PI) cable.

The choice: Host & Device, Host, Device.

Super IO Configuration



Serial Port 1 Address/IRQ

Allows BIOS Select Serial Port1 Base Addresses.

The choice: Address: Disabled, 3F8, 3E8, 2E8,
IRQ: 3, 4, 10, 11.

Serial Port 2 Address/IRQ

Allows BIOS Select Serial Port2 Base Addresses.

The choice: Address: Disabled, 2F8, 3E8, 2E8,
IRQ: 3, 4, 10, 11.

Serial Port 3 Address/IRQ

Allows BIOS Select Serial Port3 Base Addresses.

The choice: Address: Disabled, A20, A28, A30, A38, A40, A48.
IRQ: 3, 4, 10, 11.

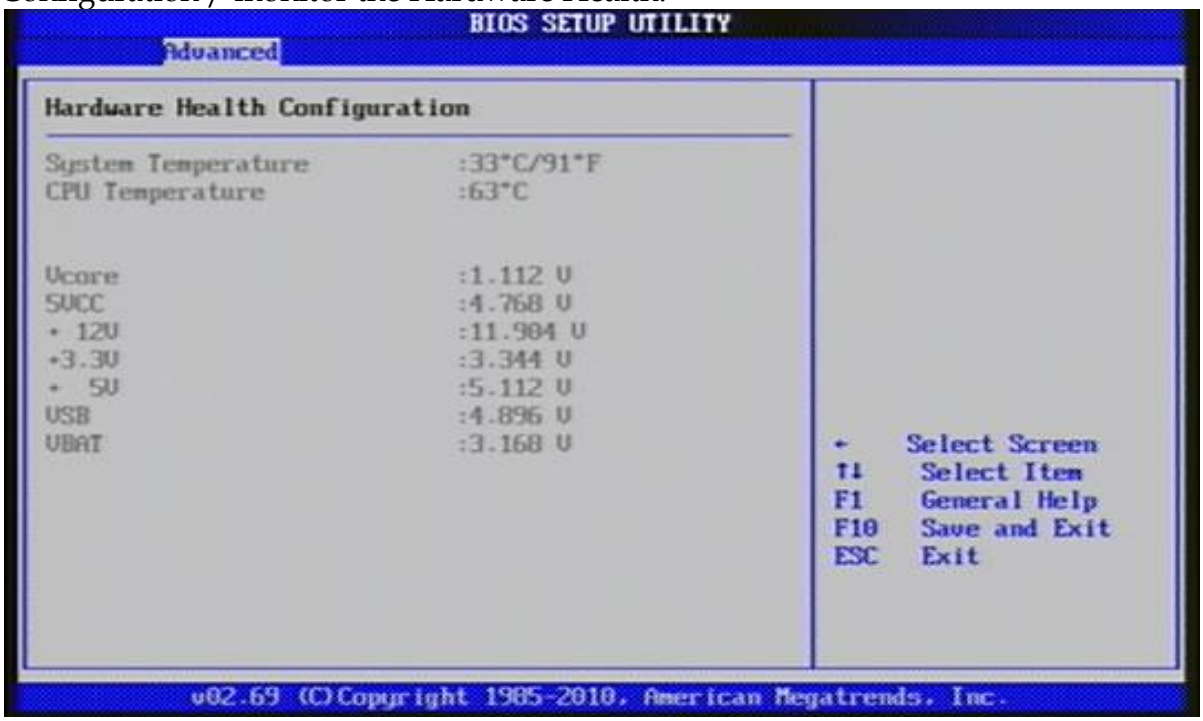
Serial Port 4 Address/IRQ

Allows BIOS Select Serial Port4 Base Addresses.

The choice: Address: Disabled, A20, A28, A30, A38, A40, A48.
IRQ: 3, 4, 10, 11.

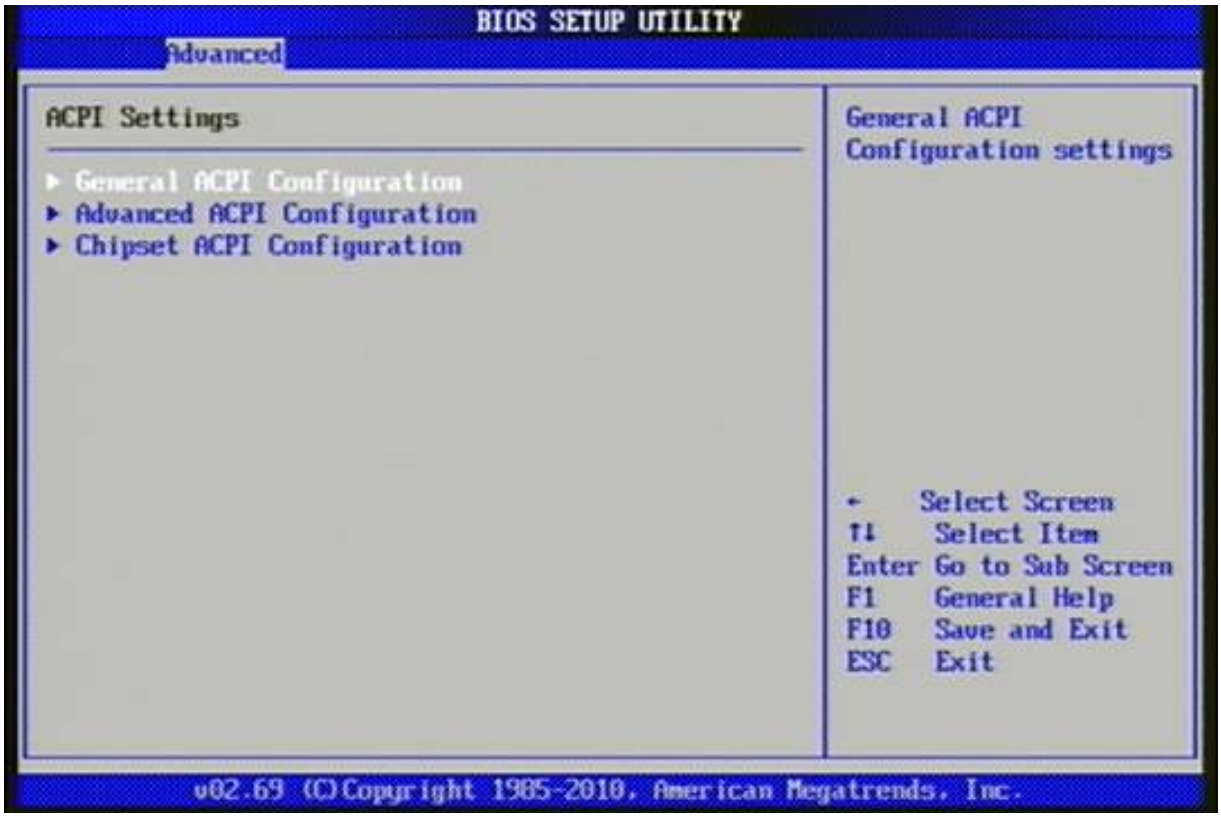
Hardware Health Configuration

Configuration / monitor the Hardware Health.



ACPI Settings

Select for Advanced ACPI Configuration.



General ACPI Configuration

Suspend mode

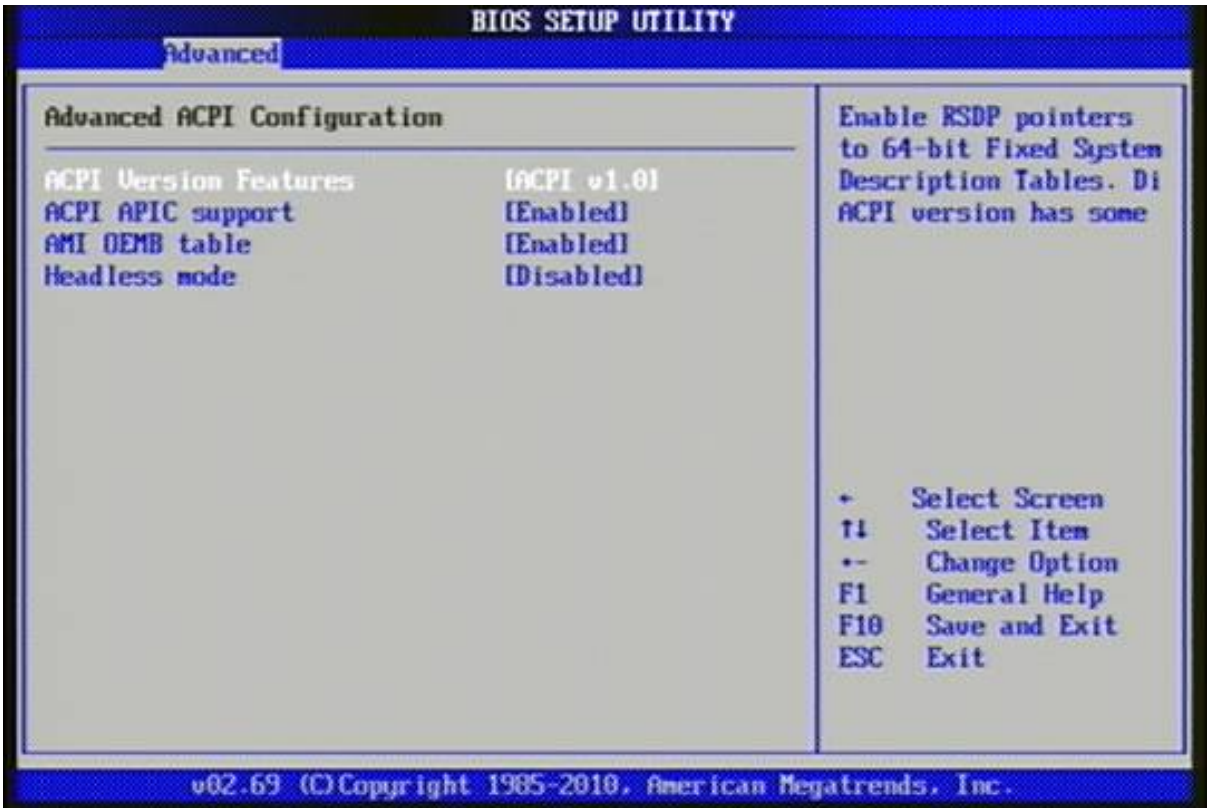
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Options are:

[S1 (POS)] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system contexts.

[S3 (STR)] The S3 sleep mode is a lower power state where the information of system configuration and open applications/ files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.

Advanced ACPI Configuration

Advanced ACPI Configuration settings, Use this section to configure additional ACPI options.


BIOS SETUP UTILITY
Advanced
Advanced ACPI Configuration
ACPI Version Features [ACPI v1.0]
ACPI APIC support [Enabled]
AMI OEMB table [Enabled]
Headless mode [Disabled]
Enable RSDP pointers to 64-bit Fixed System Description Tables. Di ACPI version has some
→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.69 (C)Copyright 1985-2010, American Megatrends, Inc.

ACPI Version Features

Enable RSDP pointers to 64-bit Fixed System Description Tables.

The choice: ACPI v1.0 / ACPI v2.0 / ACPI v3.0.

ACPI APIC support

Include ACPI APIC table pointer to RSDT pointer list.

The choice: Disabled, Enabled.

AMI OEMB table

Include OEMB table pointer to R(X) SDT pointer list.

The choice: Disabled, Enabled.

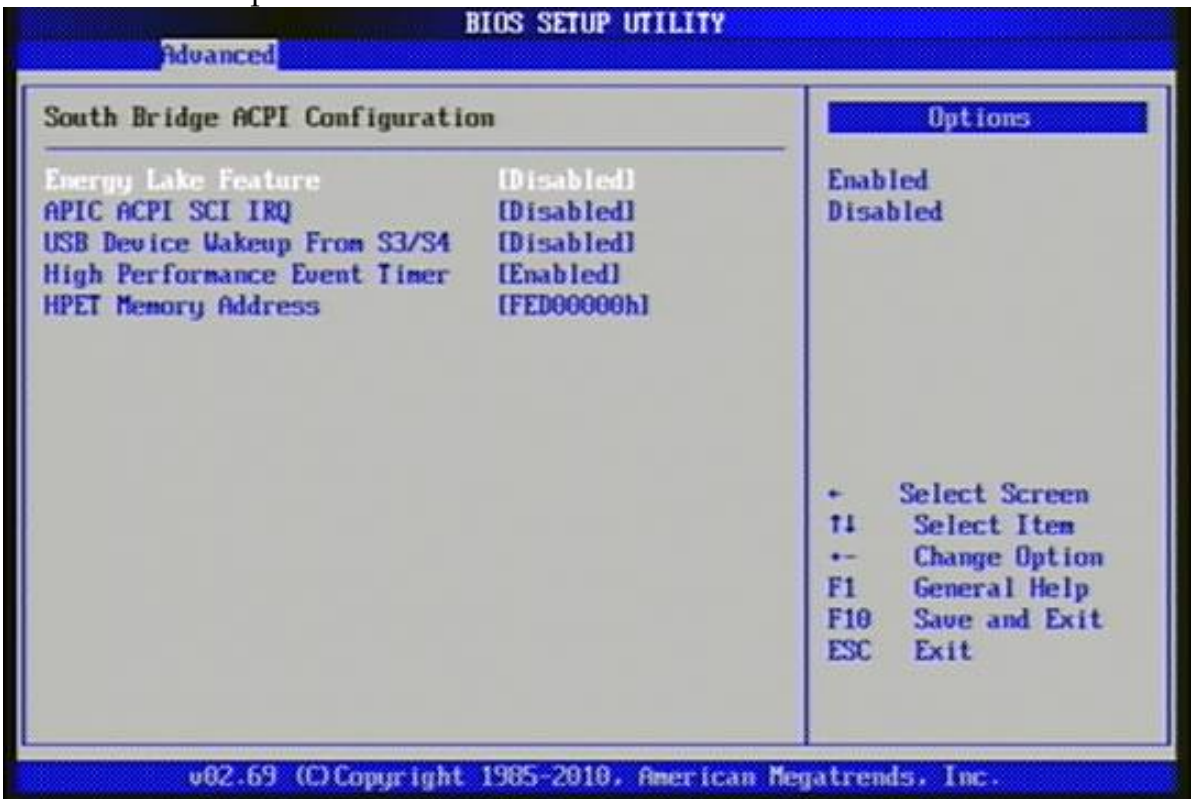
Headless mode

Enable / Disable Headless operation mode through ACPI.

The choice: Disabled, Enabled.

South Bridge ACPI Configuration

The South Bridge ACPI related Configuration settings, Use this section to configure additional ACPI options.



Energy Lake Feature

Select the ACPI state used for System Suspend.

The choice: Disabled, Enabled.

APIC ACPI SCI IRQ

Enable / Disable APIC ACPI SCI IRQ.

The choice: Disabled, Enabled.

USB Device Wakeup From S3/S4

Enable / Disable USB device Wake from S3/S4 mode.

The choice: Disabled, Enabled.

High Performance Event Timer

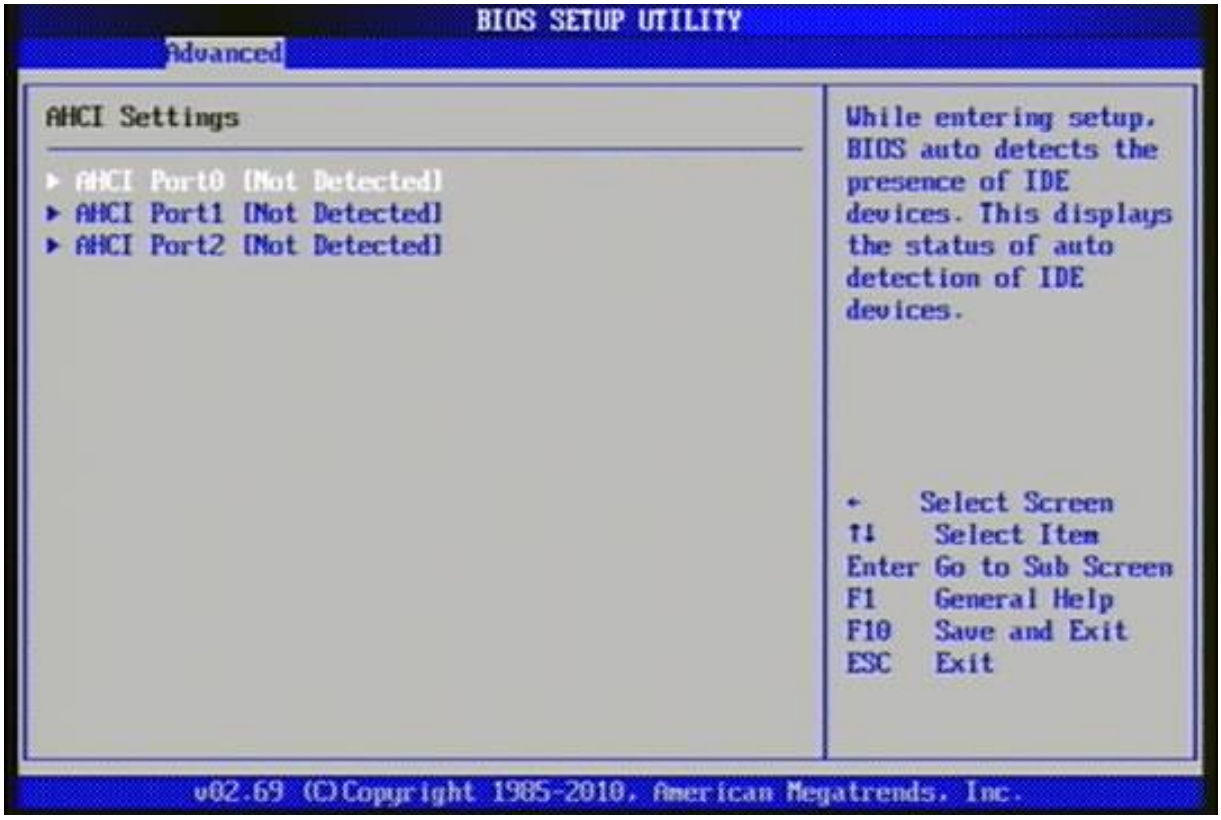
The choice: Disabled, Enabled.

HPET Memory Address

The choice: FED0000h, FED1000h, FED2000h, FED3000h

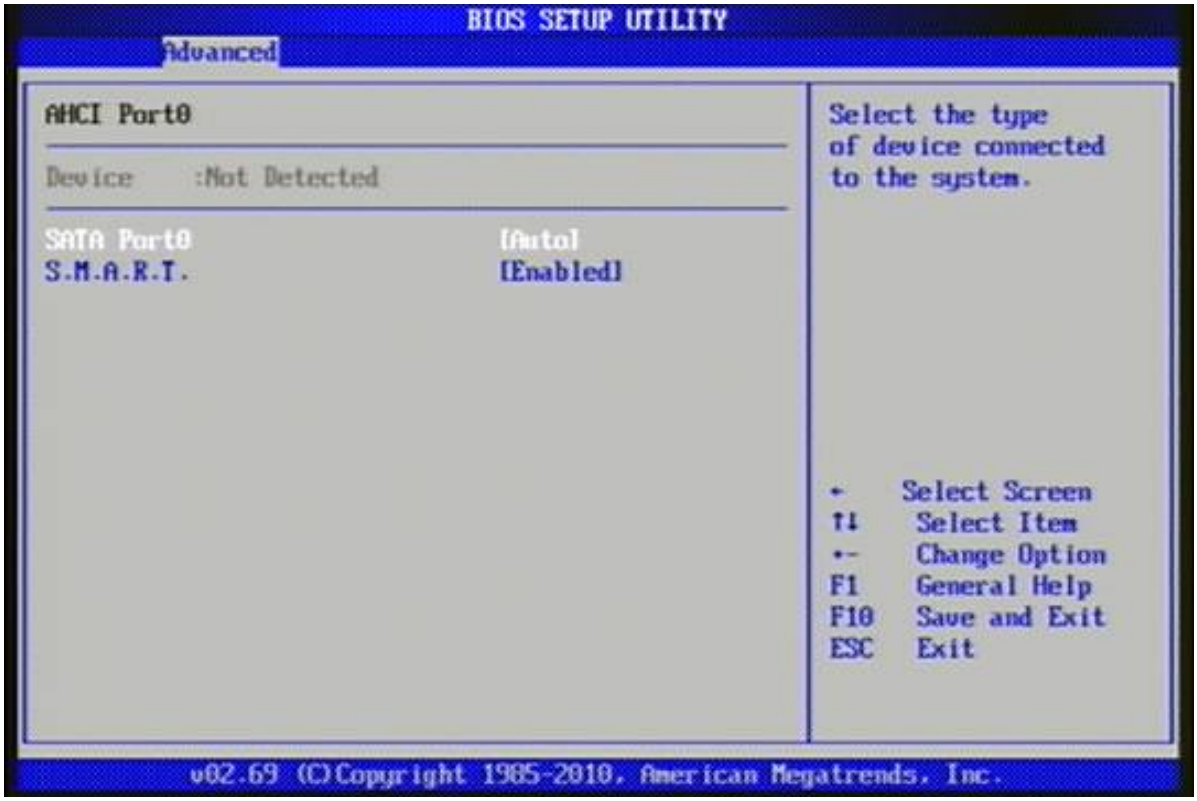
AHCI Settings

Select for AHCI Configuration.


BIOS SETUP UTILITY
Advanced
AHCI Settings
AHCI Port0 [Not Detected]
AHCI Port1 [Not Detected]
AHCI Port2 [Not Detected]
While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.69 (C)Copyright 1985-2010, American Megatrends, Inc.

AHCI Port0 ~ Port2

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.



SATA Port0 ~ Port2

Select the type of device connected to the system.

The choice: Auto, Not Installed.

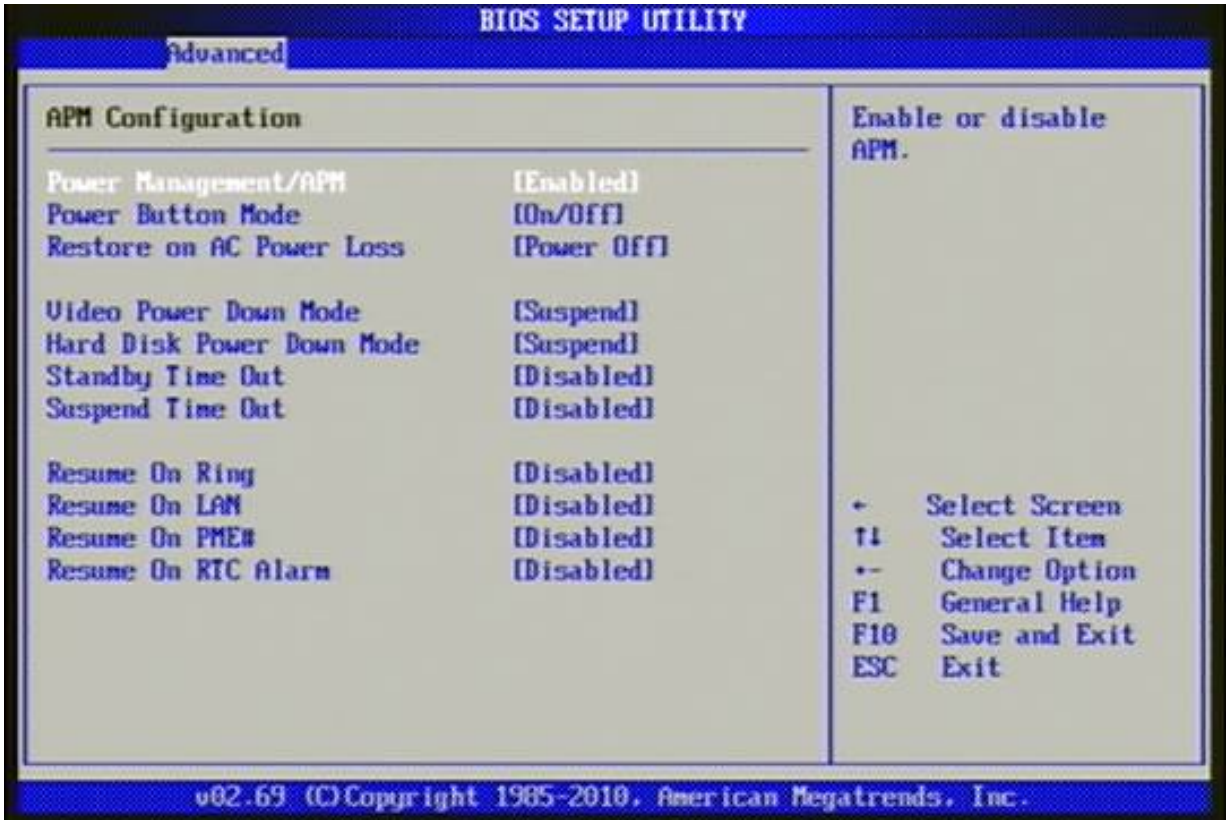
S.M.A.R.T

This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S. M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

The choice: Disabled, Enabled.

APM Configuration

Select for APM Configuration.



Power Management/APM

Enables for Power Management.

The choice: Disabled, Enabled.

Power Button Mode

Go into On/Off or Suspend when Power button is pressed.

The choice: On/Off, Suspend.

Video Power Down Mode

Power Down video in Suspend or Standby mode.

The choice: Disable, Standby, Suspend.

Hard Disk Power Down Mode

Power Down Hard Disk in Suspend or Standby mode.

The choice: Disable, Standby, Suspend.

Standby Time out

Go into Standby in the specified Time.

The choice: Disable. 1 Min, 2 Min, 4 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, 50 Min, 60 Min.

Suspend Time out

Go into Suspend in the specified Time.

The choice: Disable. 1 Min, 2 Min, 4 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, 50 Min, 60 Min.

Resume On Ring

The choice: Disabled, Enabled.

Resume on LAN

The choice: Disabled, Enabled.

Resume on PME#

The choice: Disabled, Enabled.

Resume On RTC Alarm

The choice: Disabled, Enabled.

Configure ASF Parameters

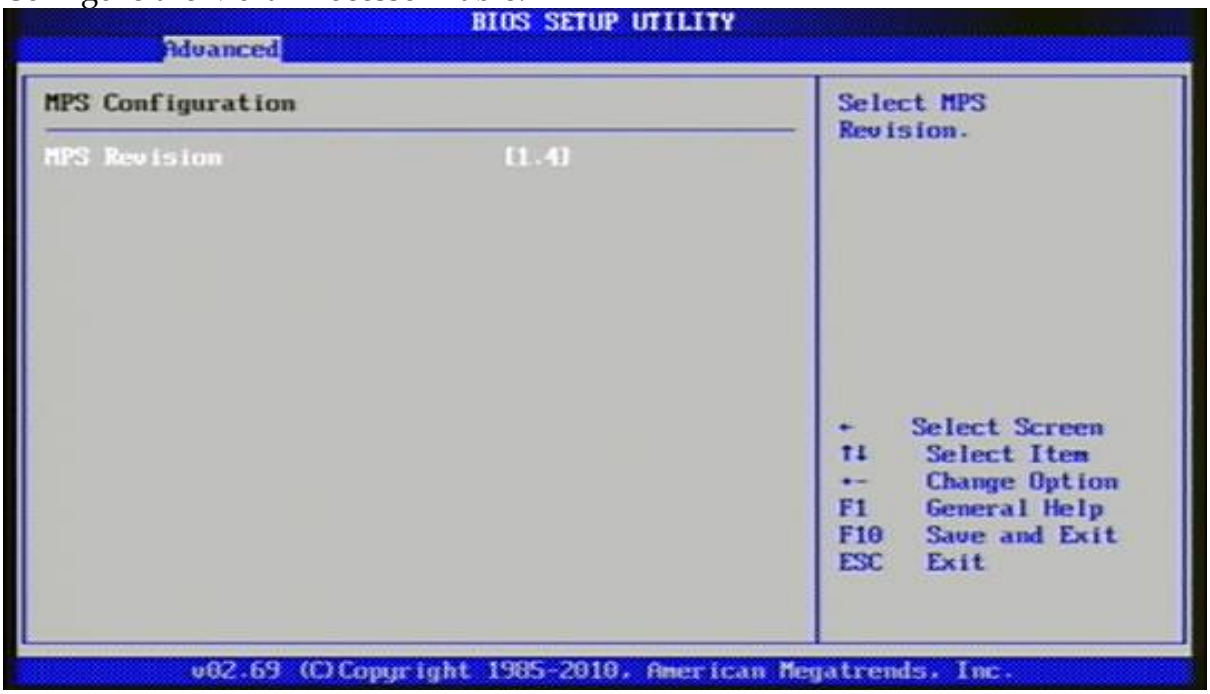
Select for ASF Support

ASF Support

The choice: Disabled, Enabled.

MPS Configuration

Configure the Multi-Processor Table.



MPS Revision

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system.

The choice: 1.1, 1.4.

PCI Express Configuration

Configure PCI Express Support.

Active State Power-Management

PCI Express L0s and L1 link power states.

The choice: Disabled, Enabled.

Smbios Configuration

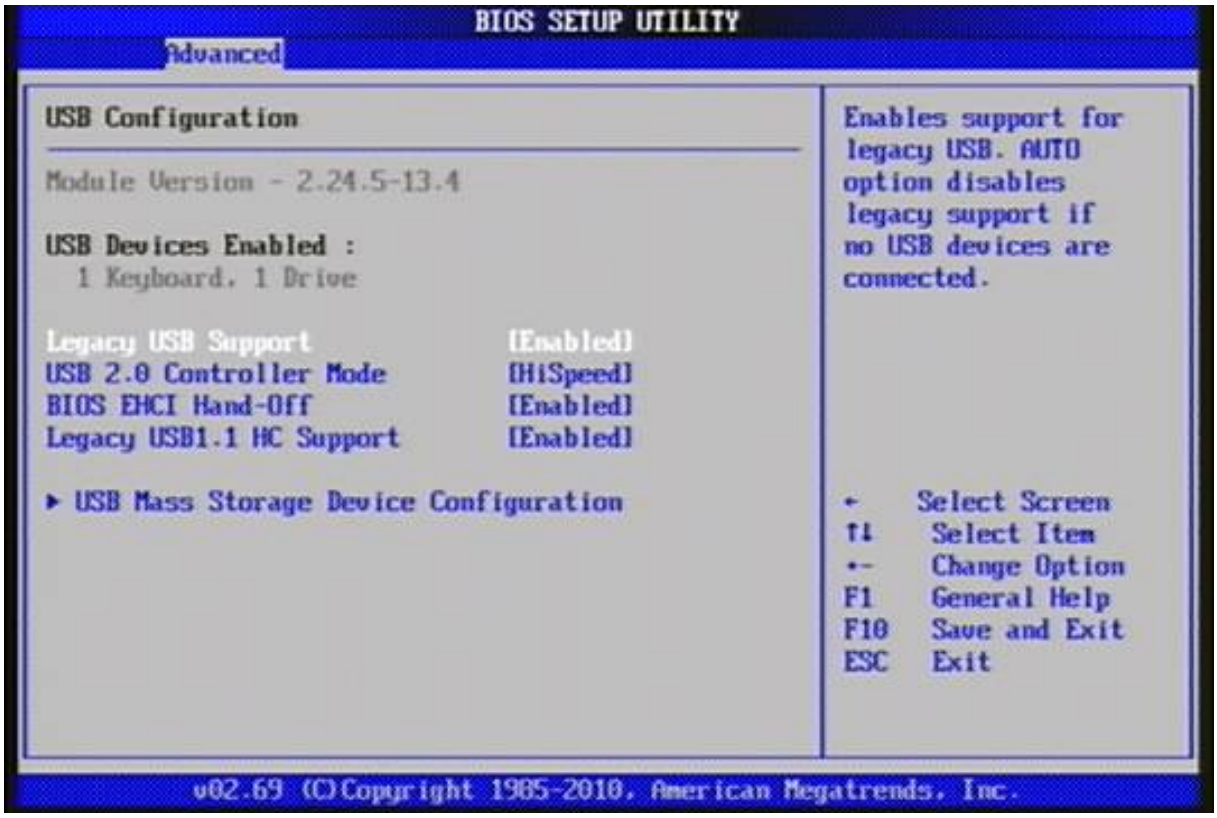
SMBIOS Configuration Menu

Smbios Smi Support

SMBIOS SMI Wrapper support for PnP Function 50h-54h

The choice: Disabled, Enabled.

USB Configuration


BIOS SETUP UTILITY
Advanced
USB Configuration
Module Version - 2.24.5-13.4
USB Devices Enabled :
1 Keyboard, 1 Drive
Legacy USB Support [Enabled]
USB 2.0 Controller Mode [HiSpeed]
BIOS EHCI Hand-Off [Enabled]
Legacy USB1.1 HC Support [Enabled]
▶ USB Mass Storage Device Configuration
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.69 (C)Copyright 1985-2010, American Megatrends, Inc.

Legacy USB Support

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

The choice: Disabled, Enabled, Auto.

USB 2.0 Controller Mode

This setting specifies the operation mode of the onboard USB 2.0 controller.

The choice: FullSpeed, HiSpeed.

BIOS EHCI Hand-Off

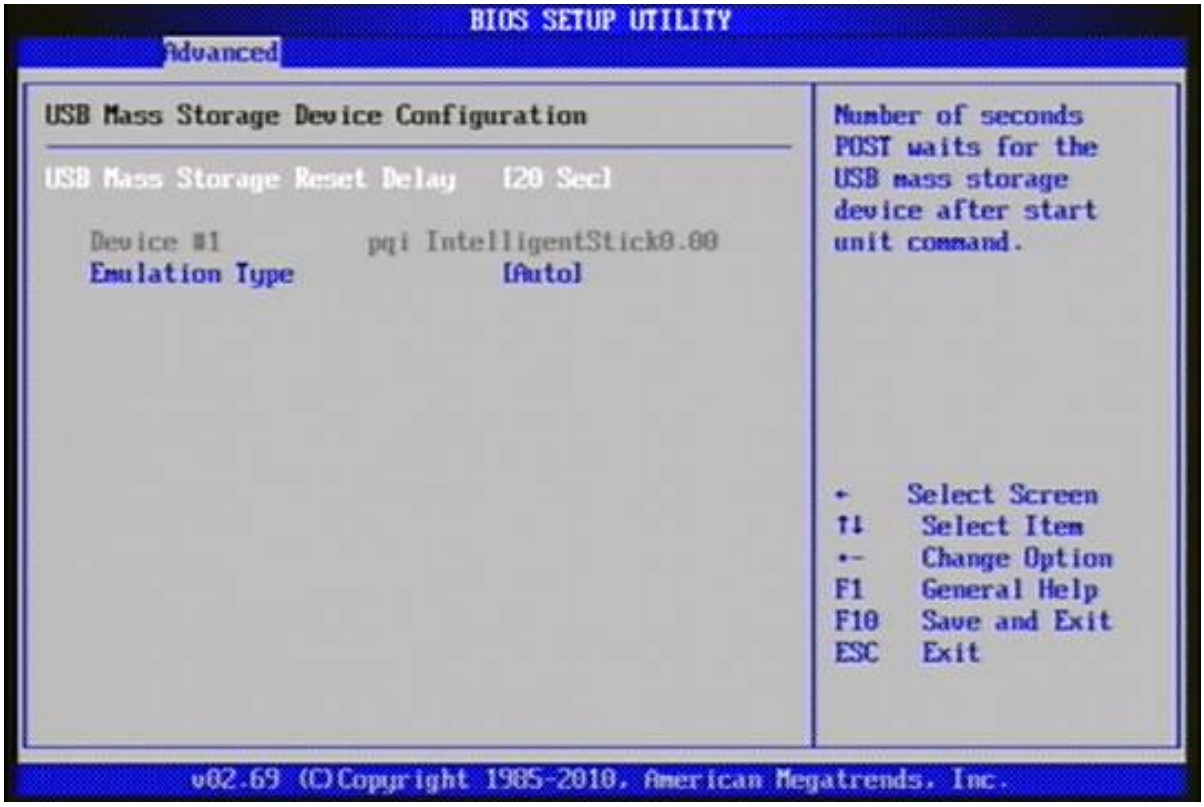
This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.

The choice: Disabled, Enabled.

Legacy USB1.1 HC Support

The choice: Disabled, Enabled

USB Mass Storage Device Configuration


BIOS SETUP UTILITY
Advanced
USB Mass Storage Device Configuration
USB Mass Storage Reset Delay [20 Sec]
Device #1 pqi IntelligentStick0.00
Emulation Type [Auto]
Number of seconds POST waits for the USB mass storage device after start unit command.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.69 (C)Copyright 1985-2010, American Megatrends, Inc.

USB Mass Storage Device Configuration

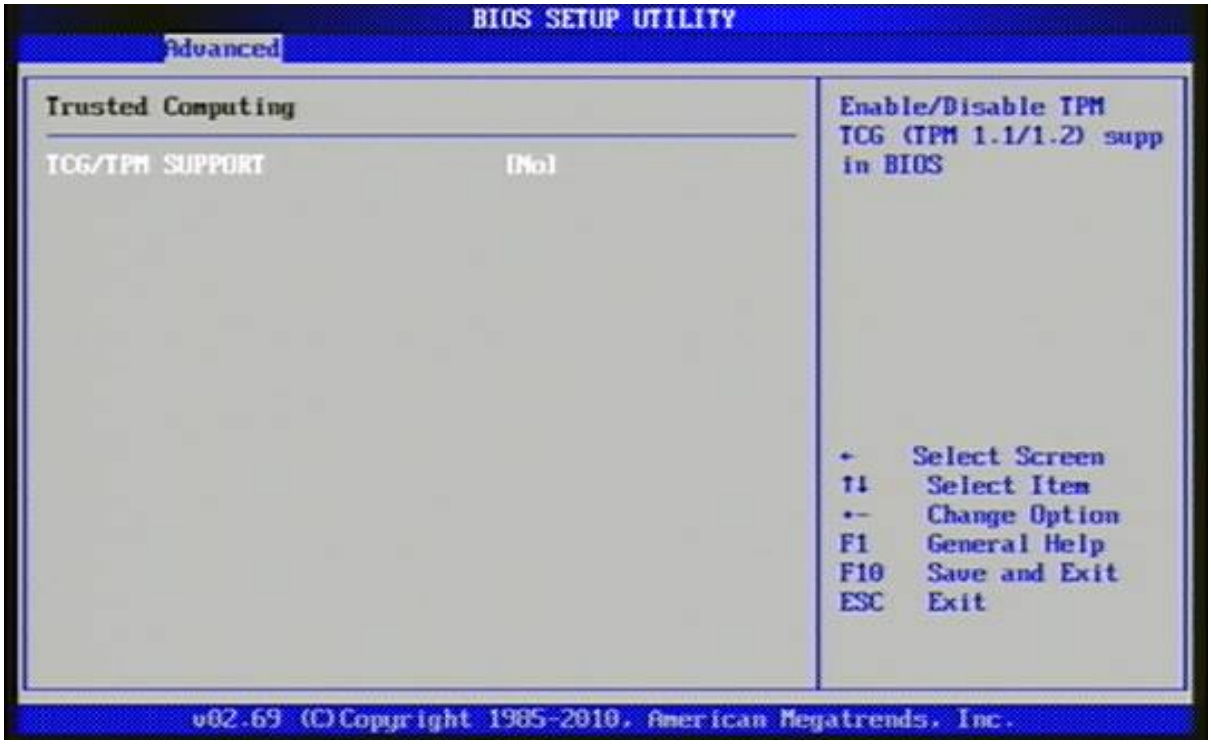
Number of seconds POST waits for the USB mass storage device after start unit command.

The choice: 10 Sec, 20 Sec, 30 Sec, 40 Sec.

Emulation Type.

The choice: Auto, Floppy, Forced FDD, Hard Disk, CDROM.

Trusted Computing

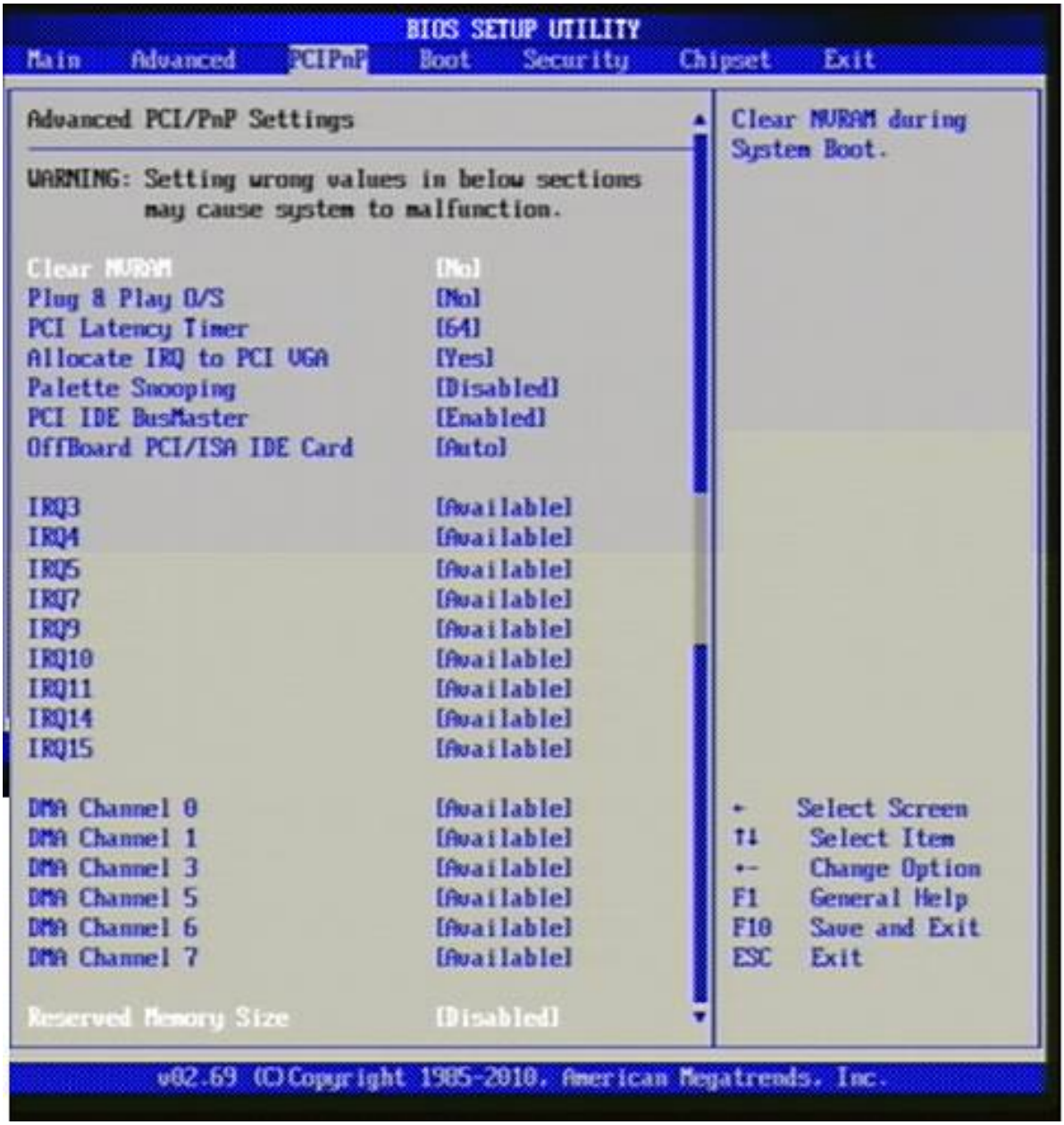


TCG.TPM SUPPORT

The choice: No, Yes

4.4 PCIPnP

Advanced PCI/PnP setting wrong values in below sections may cause system to malfunction.



Clear NVRAM

Clear NVRAM during System Boot.

The choice: No, Yes.

Plug & Play O/S

No: lets the BIOS configure all the devices in the system.
Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.

The choice: No, Yes.

PCI Latency Timer

Select value in units of PCI clocks for PCI device latency timer register.

The choice: 32, 64, 96, 128, 160, 192, 224, 248.

Allocate IRQ to PCI VGA

Yes: Assigns IRQ to PCI VGA card if card requests an IRQ.
No: Does not assign IRQ to PCI VGA card even if card requests an IRQ.

The choice: No, Yes.

Palette Snooping

Enabled: informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.

The choice: Disabled, Enabled.

PCI IDE BusMaster

Enabled: Uses PCI bus mastering for reading / writing to IDE drives.

The choice: Disabled, Enabled.

OffBoard PCI/ISA IDE Card

Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card. AUTO: Works for most PCI IDE cards

The choice: Auto, PCI Slot1, PCI Slot2, PCI Slot3, PCI Slot4, PCI Slot5, PCI Slot6.

IRQ 3 / IRQ 4 / IRQ5 / IRQ7 / IRQ 9 / IRQ 10 / IRQ 11 / IRQ 14 / IRQ 15

Available: Specified IRQ is available to be used by PCI/PnP devices.
Reserved: Specified IRQ is reserved for used by Legacy ISA devices.

The choice: Available, Reserved.

DMA Channel 0 / DMA Channel 1 / DMA Channel 3 / DMA Channel 5 / DMA Channel 6 / DMA Channel 7

Available: Specified DMA is available to be used by PCI/PnP devices.
Reserved: Specified DMA is reserved for use by Legacy ISA devices.

The choice: Available, Reserved.

Reserved Memory Size

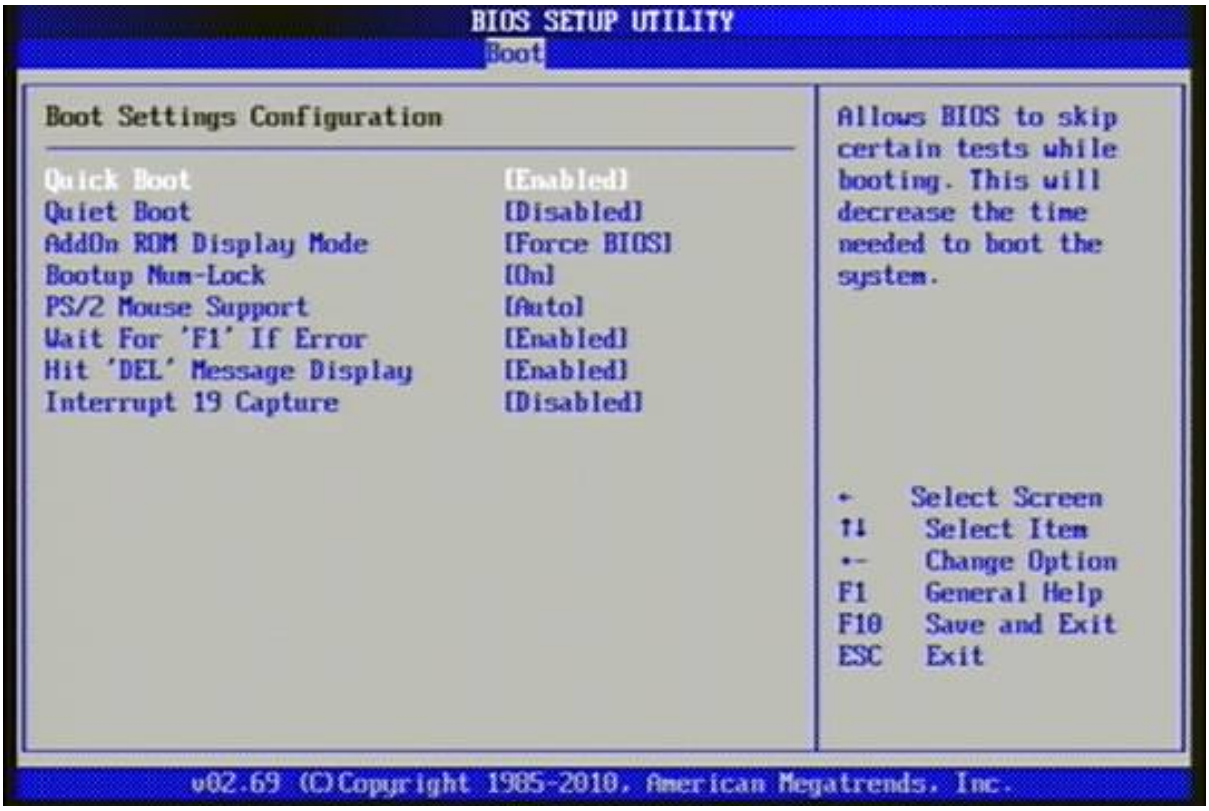
Select Size of memory block to reserve for legacy ISA devices.

The choice: Disabled, 16K, 32K, 64K.

4.5 Boot

Use this menu to specify the priority of boot devices.

Boot Settings Configuration


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
PS/2 Mouse Support [Auto]
Wait For 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Interrupt 19 Capture [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
→ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.69 (C)Copyright 1985-2010, American Megatrends, Inc.

Quick Boot

Enabling this setting will cause the BIOS power-on self test routine to skip some of its tests during boot up for faster system boot.

The choice: Disabled, Enabled.

Quiet Boot

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo. When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.
When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

The choice: Disabled, Enabled.

AddOn ROM Display Mode

This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.

The choice: Force BIOS, Keep Current.

Bootup Num-Lock

This setting is to set the Num Lock status when the system is powered on.
Setting to [On] will turn on the Num Lock key when the system is powered on.
Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

The choice: Off, On.

PS/2 Mouse support

Select [Enabled] if you need to use a PS/2-interfaced mouse in the operating system.

The choice: Disabled, Enabled, Auto.

Wait For 'F1' If Error

When this setting is set to [Enabled] and the boot sequence encounters an error, it asks you to press F1. If disabled, the system continues to boot without waiting for you to press any keys.

The choice: Disabled, Enabled.

Hit 'DEL' Message Display

Set this option to [Disabled] to prevent the message as follows:

The choice: Disabled, Enabled.

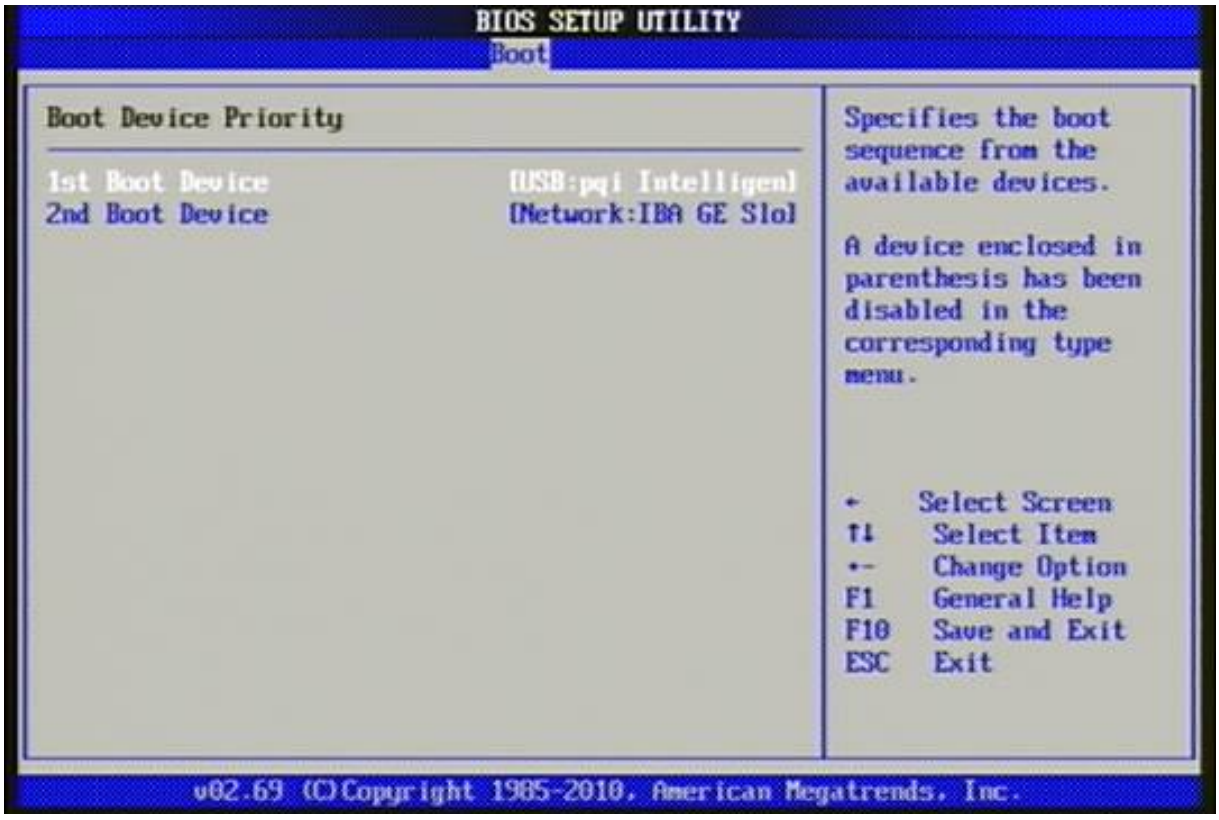
Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When enabled, this BIOS feature allows the ROM BIOS of these host adaptors to "capture" Interrupt 19 during the boot process so that drives attached to these adaptors can function as bootable disks. In addition, it allows you to gain access to the host adaptor's ROM setup utility, if one is available.

When disabled, the ROM BIOS of these host adaptors will not be able to "cap ture" Interrupt 19. Therefore, you will not be able to boot operating systems from any bootable disks attached to these host adaptors. Nor will you be able to gain access to their ROM setup utilities.

The choice: Disabled, Enabled.

Boot Device Priority

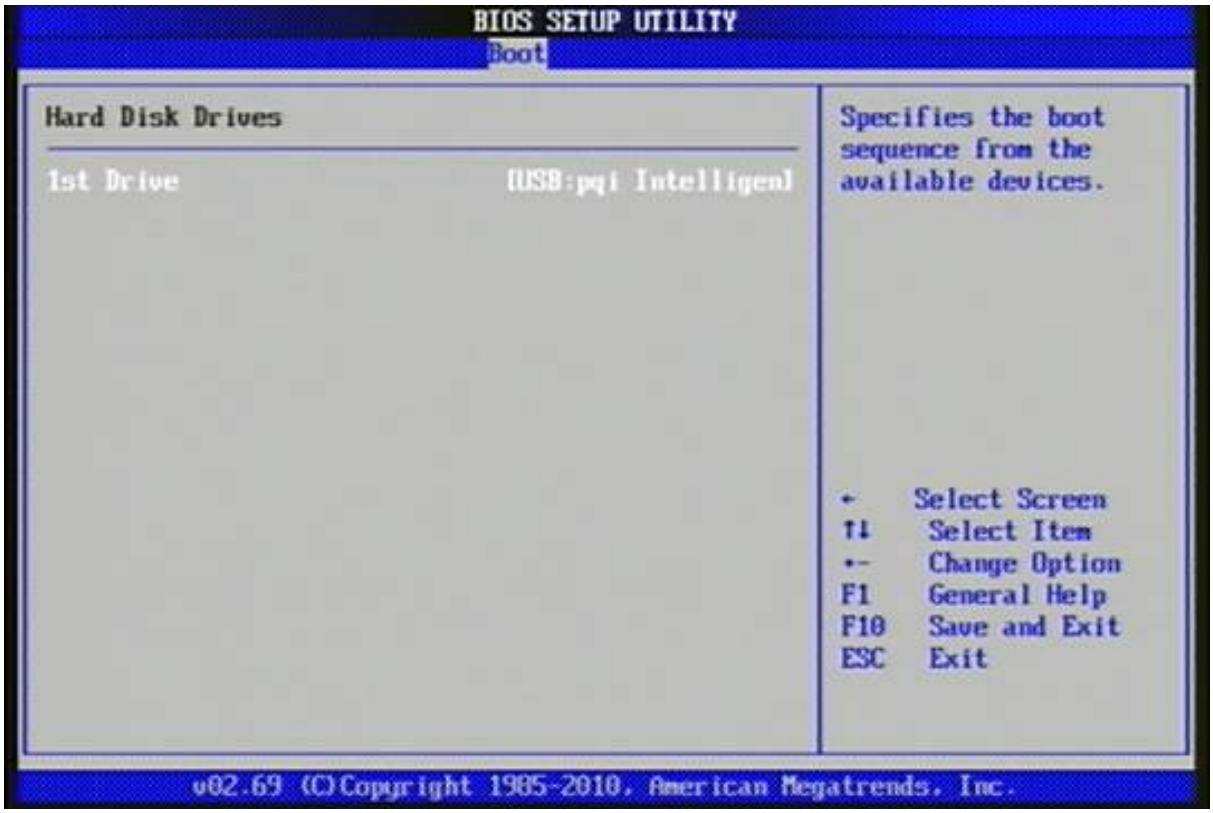


1st Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <—> or <PageUp>, <PageDown> key to move it up/down in the priority list.

The choice: (Network: IBA GE Slot 00C8 v1324), Disabled.

Hard Disk Drives

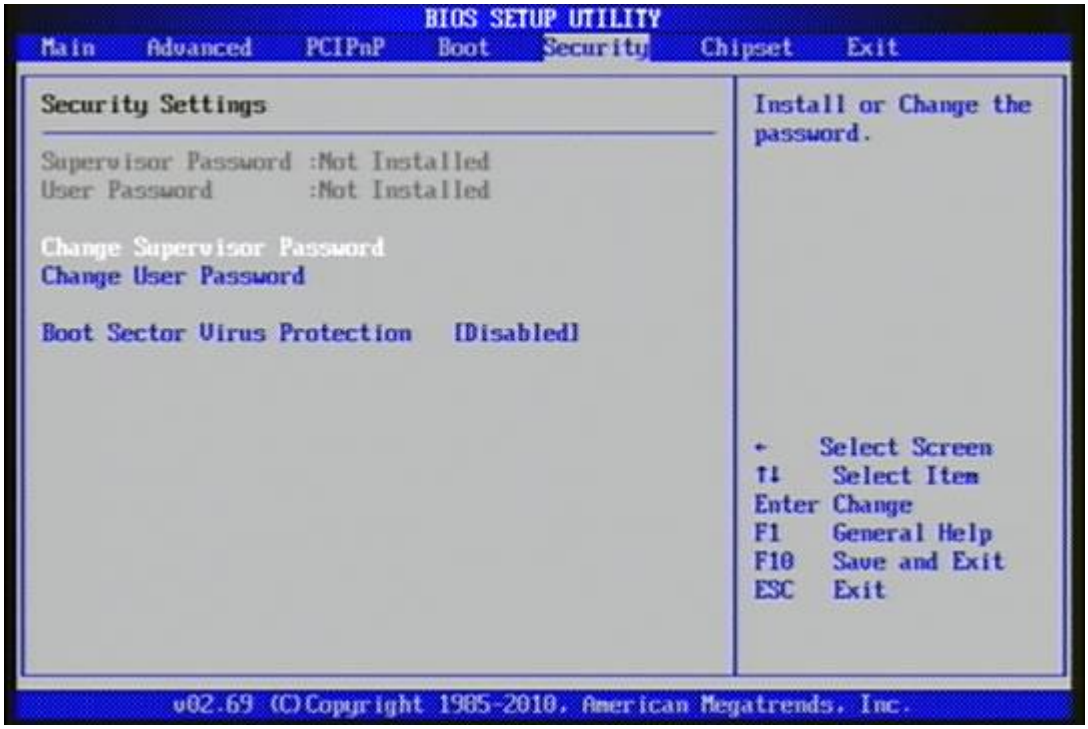


1st Drive

This setting allows users to set the priority of the removable devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <—> or <PageUp>, <PageDown> key to move it up/down in the priority list.

4.6 Security

Use this menu to set supervisor and user passwords.



Supervisor Password / Change Supervisor Password

Supervisor Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

User Password / Change User Password

User Password controls access to the system at boot. These settings allow you to set or change the user password.

Boot Sector Virus Protection

Boot Sector Virus Protection.

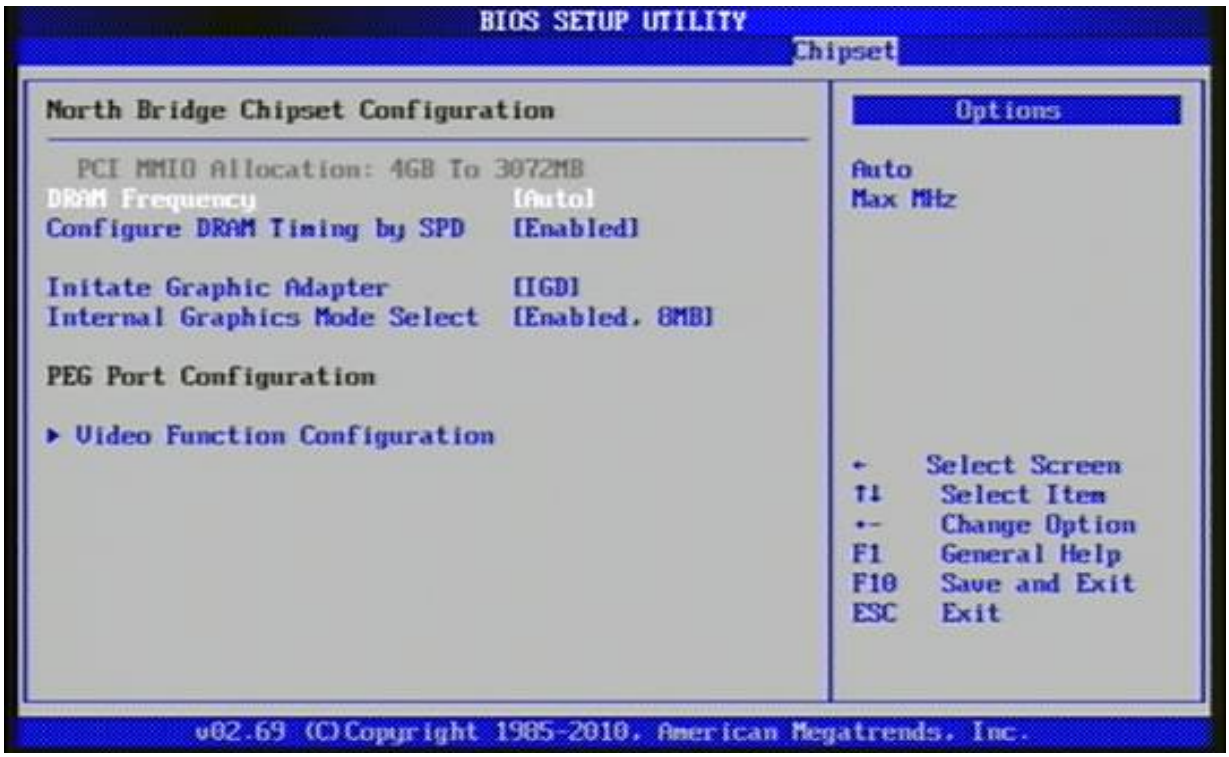
The choice: Disabled, Enabled.

4.7 Chipset

This menu controls the advanced features of the onboard Northbridge and Southbridge.

BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
▶ North Bridge Configuration
▶ South Bridge Configuration
Configure North Bridge features.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.69 (C)Copyright 1985-2010, American Megatrends, Inc.

North Bridge Chipset Configuration



DRAM Frequency

Users are recommended to use Auto for memory frequency selection.

The choice: Auto, Max MHz.

Configure DRAM Timing by SPD

This option provides DRAM plug-and-play support by serial presence detect (SPD) mechanism via the system management bus (SMBUS) interface.

The choice: Disabled, Enabled.

Initate Graphic Adapter

Select which graphics controller to use as the primary boot device.

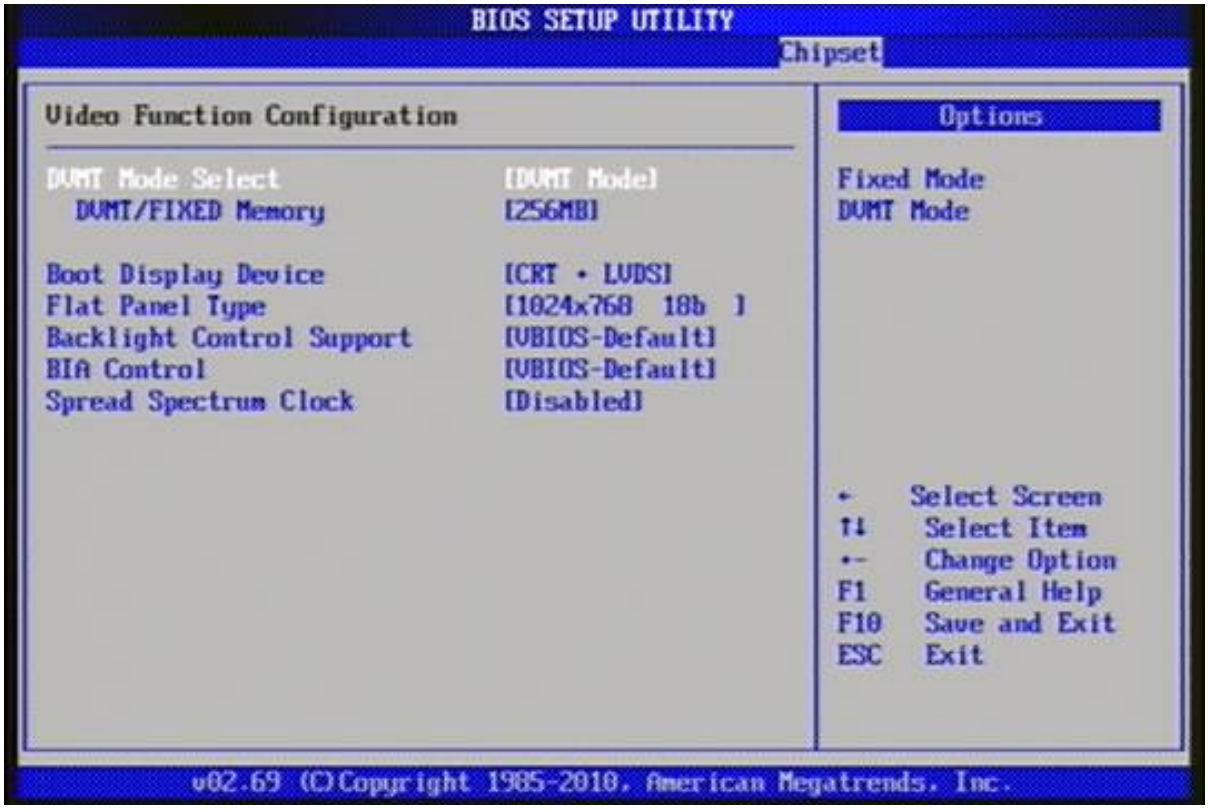
The choice: IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI.

Internal Graphics Mode Select

Select the amount of system memory used by the internal graphics device.

The choice: Enabled, 8MB.

Video Function Configuration



DVMT Mode Select

Intel's Dynamic Video Memory Technology (DVMT) allows the system to dynamically allocate memory resources according to the demands of the system at any point in time. The key idea in DVMT is to improve the efficiency of the memory allocated to either system or graphics processor.

It is recommended that you set this BIOS feature to DVMT Mode for maximum performance. Setting it to DVMT Mode ensures that system memory is dynamically allocated for optimal balance between graphics and system performance.

The choice: Fixed Mode, DVMT Mode.

DVMT/FIXED Memory

When set to DVMT/FIXED Mode, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics processor and the operating system.

The choice: 128MB, 256MB, Maximum DVMT.

Boot Display Device

The choice: CRT, LVDS, CRT+LVDS.

Flat Panel Type

The choice: 640x480 18 bit, 800x600 18 bit, 1024x768 18 bit, 1280x1024 24bit.

Backlight Control Support

The choice: VBIOS-Default, Both BLC & BIA Disable, BLC Enabled.

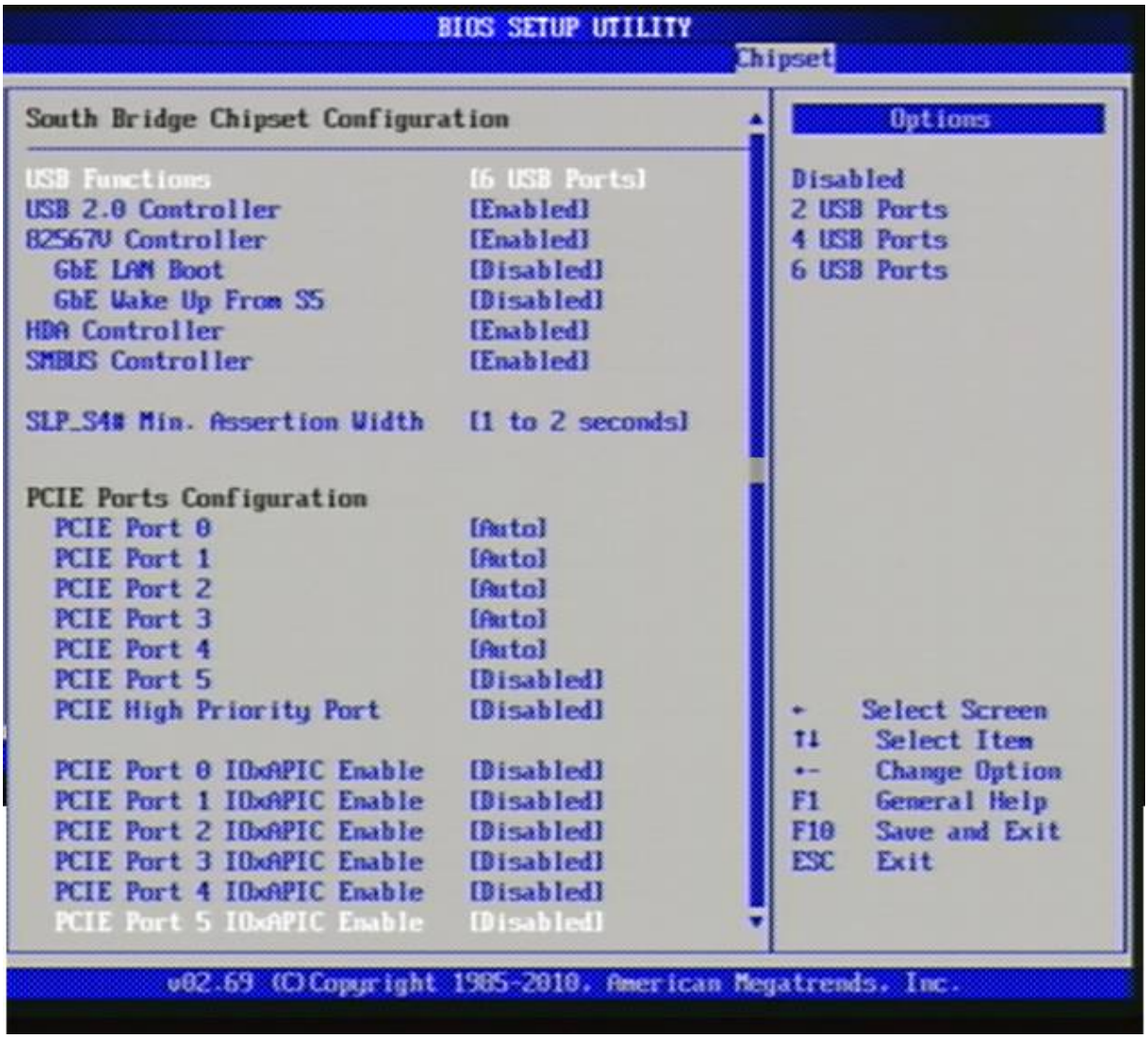
BIA Control

The choice: VBIOS-Default, BIA Disabled, BIA Enabled at Level 1, BIA Enabled at Level 2, BIA Enabled at Level 3, BIA Enabled at Level 4, BIA Enabled at Level 5.

Spread Spectrum Clock

The choice: Disabled, Enabled.

South Bridge Configuration



USB Functions

This setting specifies the function of the onboard USB controller.

The choice: Disabled, 2 USB Ports, 4 USB Ports, 6 USB Ports.

USB 2.0 Controller

Set to [Enabled] if you need to use any USB 2.0 device in the operating system that does not support or have any USB 2.0 driver installed, such as DOS and SCO Unix.

The choice: Enabled, Disabled.

82567V Controller

The choice: Enabled, Disabled.

GbE LAN Boot

When [Enabled], the BIOS attempts to boot from a LAN boot image before it attempts to boot from a local storage device.

The choice: Enabled, Disabled.

GbE Wake Up From S5

This field specifies whether the system will be awakened from the S5 power saving mode when activity or input signal of onboard LAN is detected.

The choice: Enabled, Disabled.

HDA Controller

This setting controls the High Definition Audio interface integrated in the Southbridge.

The choice: Enabled, Disabled.

SMBUS Controller

The choice: Enabled, Disabled.

SLP_S4# Min. Assertion Width

The choice: 4 to 5 seconds, 3 to 4 seconds, 2 to 3 seconds, 1 to 2 seconds.

PICE Port 0/1/2/3/4/5

The choice: Auto, Enabled, Disabled.

PICE High Priority Port

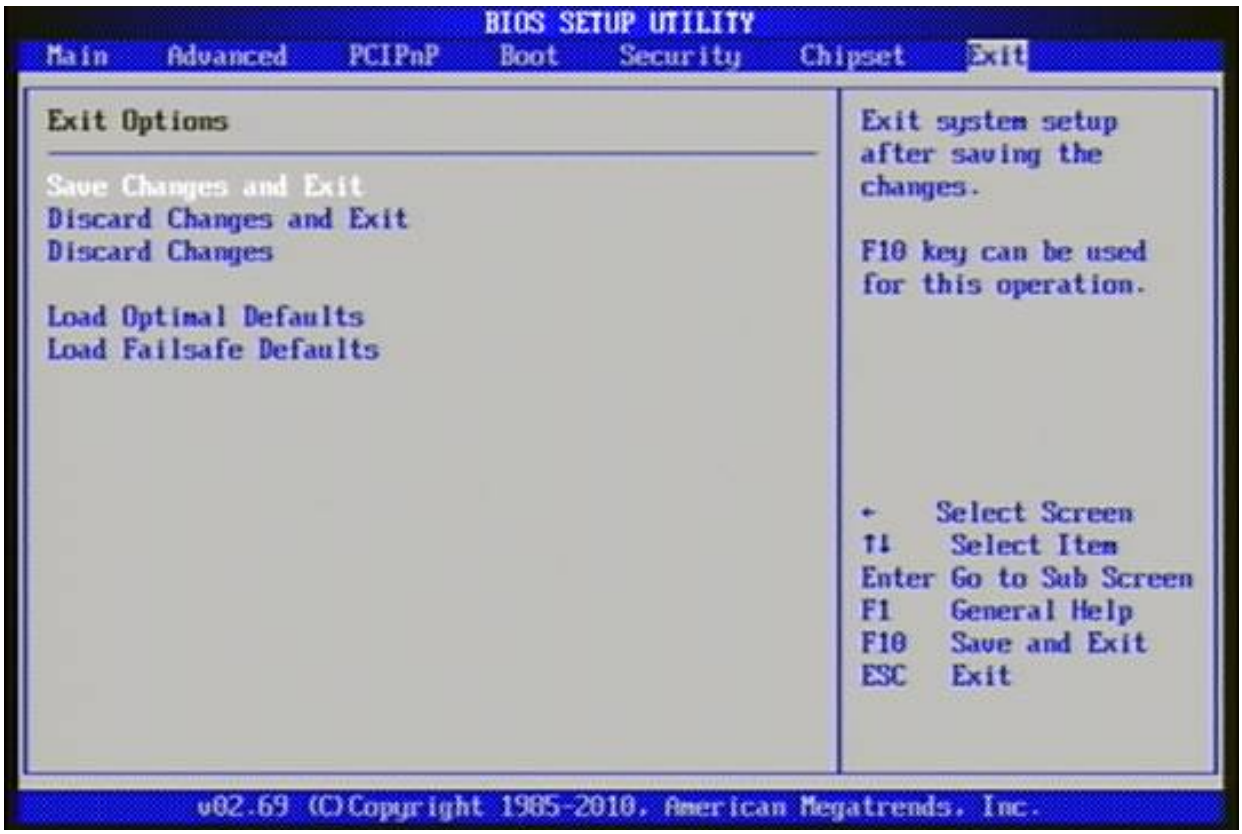
The choice: Disable, Port 0, Port 1, Port 2, Port 3, Port 4, Port 5.

PICE Port 0/1/2/3/4/5 IOxAPIC Enable

The choice: Enabled, Disabled.

4.8 Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.69 (C)Copyright 1985-2010, American Megatrends, Inc.

Saving Changes and Exit

Exit System Setup and save your changes to CMOS. Pressing <Enter> on this item asks for confirmation: Save changes to CMOS and exit the Setup Utility.

Discard Changes and Exit

Abandon all changes and exit the Setup Utility.

Discard Changes

Abandon all changes and continue with the Setup Utility.

Load Optimal Defaults

Use this menu to load the default values set by the SBC manufacturer specifically for optimal performance of the SBC.

Load Failsafe Defaults

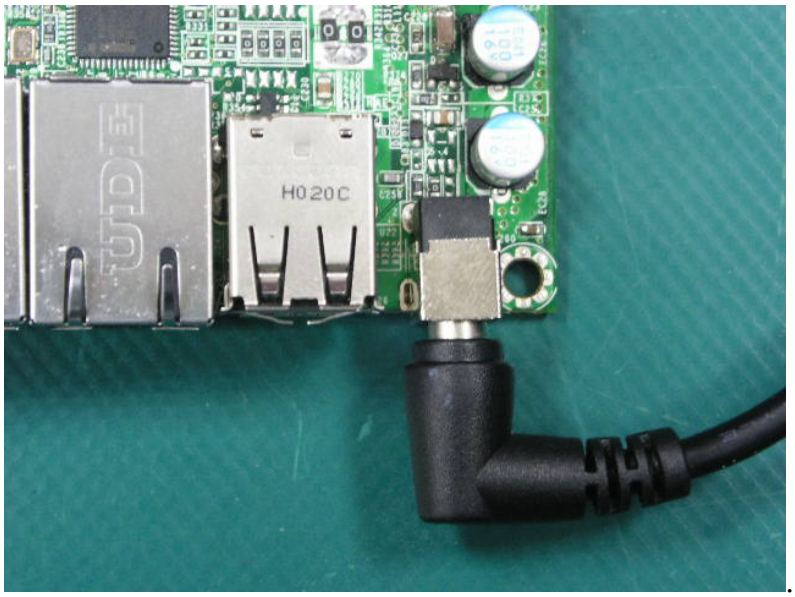
Use this menu to load the default values set by the BIOS vendor for stable system performance

Chapter 5
Troubleshooting

This chapter provides a few useful tips to quickly get PEB-2781 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

DC 12V Power Input
PEB-2781 supports DC12V input only.



5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the device cables required before turning on DC 12V in. 200-pin DDR3 SO-DIMM, keyboard, mouse, SATA hard disk, VGA connector, device power cables are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with PEB-2781, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Optimal Defaults**", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Advanced, pick up any one from Primary/Secondary Master/Slave IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ#	Default Use
IRQ 0	System Timer
IRQ 1	Keyboard Event
IRQ 2	Usable IRQ
IRQ 3	COM2
IRQ 4	COM1
IRQ 5	Usable IRQ
IRQ 6	Diskette Event
IRQ 7	Usable IRQ
IRQ 8	Real-Time Clock
IRQ 9	Usable IRQ
IRQ 10	Usable IRQ
IRQ 11	Usable IRQ
IRQ 12	IBM Mouse Event
IRQ 13	Coprocessor Error
IRQ 14	Hard Disk Event
IRQ 15	Usable IRQ

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

.

Memory Area	Size	Description
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-9FBF	577K	【Available】
First Meg -- Conventional memory end at 639K --		
9FC0-9FFF	1K	Extended BIOS Area
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CD9F	54K	Video ROM
CDA0-EFFF	137K	Unused
F000-FFFF	64K	System ROM

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

IRQ#	Current Use	Default Use
IRQ 0	System ROM	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	【Unassigned】	Usable IRQ
IRQ 3	System ROM	COM2
IRQ 4	System ROM	COM1
IRQ 5	【Unassigned】	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	Unused	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	【Unassigned】	Usable IRQ

IRQ 10	【Unassigned】	Usable IRQ
IRQ 11	【Unassigned】	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	【Unassigned】	Usable IRQ